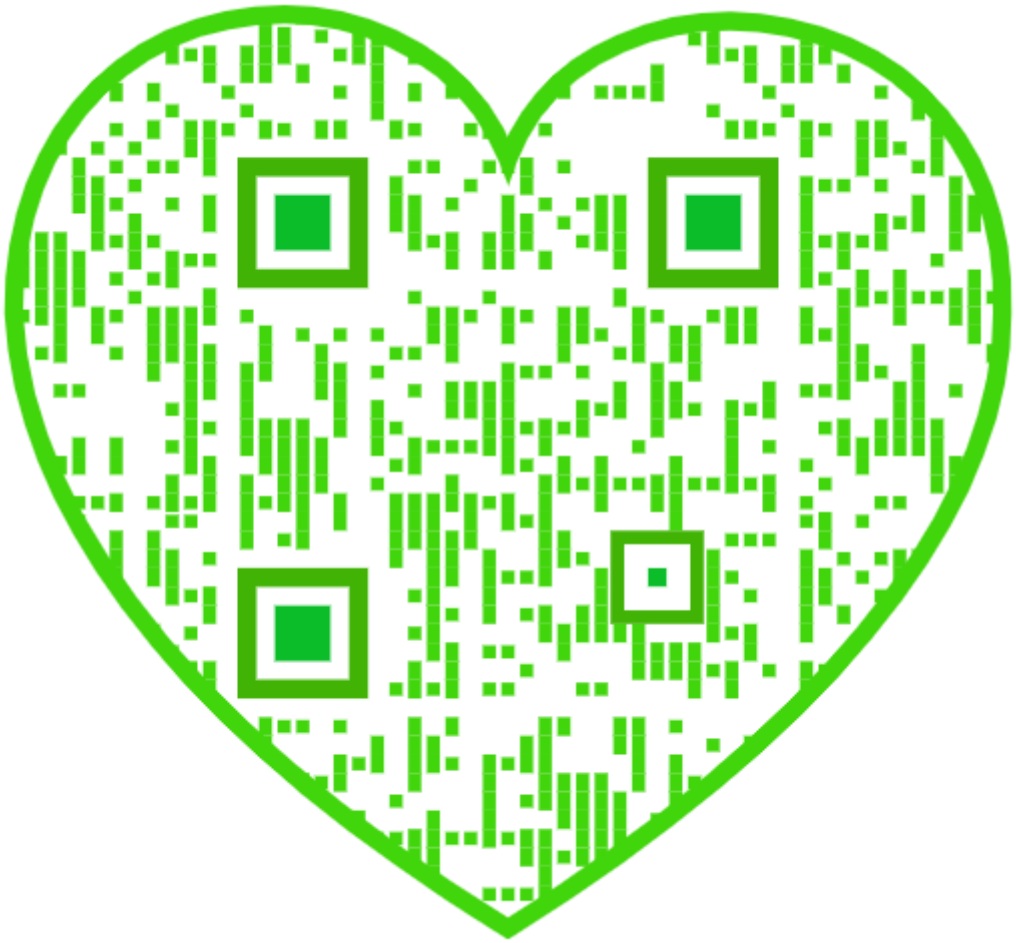


THE ARCHITECT AND ENGINEER OF CALIFORNIA

JULY, 1917 VOL. L. No. 1

PVBLISHED IN SAN FRANCISCO ·
25 CENTS A COPY · ONE DOLLAR AND A HALF A YEAR

Specifying eastern plumbing fixtures is like bringing coal to Newcastle.

The leading Architects of the Coast specify "Pacific" Plumbing Fixtures because they do not think it good business to send thousands of miles away for plumbing fixtures which are of no better quality, and cost as much as those locally manufactured.

By specifying "Pacific" Plumbing Fixtures, they eliminate the possibility of costly delays — are able to have special fixtures made just as they want them — and the factories are close at hand to promptly make good the "Pacific" guarantee.

"Pacific"

PLUMBING FIXTURES

FOR SALE BY ALL JOBBERS

Main Office and Showroom,
67 New Montgomery St.,
San Francisco, California

Factories,
Richmond and
San Pablo, California

ALL THE WINDOWS

(Both Wood and Metal)
in
GIMBAL BROS.
BUILDING
ALFRED KUHN, Architect

ARE

HAUSER
Reversible

HAUSER WINDOWS embody all the latest ideas and improvements in Casement, Vertical Hung and Double Acting Windows. They are water-tight, dust-proof and most easily operated. The U. S. District Court recently decided that the **HAUSER REVERSIBLE WINDOW** is in **a class by itself.**

Hauser Reversible Window Co.

Phone Kearny 3706 **157 MINNA ST., SAN FRANCISCO**

For Modern Store-Fronts

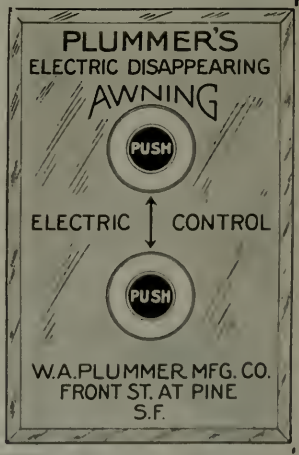
Our Disappearing
AWNINGS

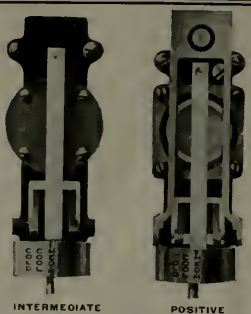
are constructed with no outside attachments below recess, above windows gears entirely concealed.

Absolutely practicable when extended and when rolled up is contained in recess 8" x 8½", with front board, which can be utilized as a sign board, covering front of recess. Operated either by crank or electric control, from any part of building.

Send for Architect's Sheet of Specifications.

The new Southern Pacific Building, San Francisco, is being equipped with **Plummer's Disappearing Awnings**





INTERMEDIATE POSITIVE

The Above Types of THERMOSTATS for VENTILATION and DIRECT RADIATION Respectively, are less than five inches long and represent

"THE LAST WORD IN TEMPERATURE REGULATION"

Write us about them

JOHNSON SERVICE CO.

800 Chamber of Commerce Bldg., Portland, Ore.
1104 White Building, Seattle, Wash.
604 Citizens Bank Bldg., Los Angeles, Cal.
149 FIFTH ST., SAN FRANCISCO, CAL.

L. P. Hobart, Architect
Clinton Construction Co., General Contractors

The Pacific Coast Shredded Wheat Company
OAKLAND, CALIFORNIA

Every modern factory is an advertisement for Fenestra Solid Steel Windows

Ask for our Stock Sash Folder

Detroit Steel Products Co.
DEPARTMENT A20, DETROIT, MICH.

Fenestra
SOLID STEEL WINDOWS

THE HYLOPLATE BLACKBOARD

SCHOOL FURNITURE
Auditorium Seating

MAPS
GLOBES
ATLASES

C. F. WEBER & CO.

365 Market Street
SAN FRANCISCO

222-224
S. Los Angeles St.
LOS ANGELES

100 W. Commercial
Row, RENO, NEV.

124 W. Washington
Street, PHOENIX, ARIZ.

KEYHOLD LATH

(Made in California)

A GYPSUM and magnesite plaster board with the perfect mechanical key, complying with the ordinance in building laws—non-conductor of sound, heat and electricity. Saves in time and expense over metal lath construction. We give specifications, demonstrations and figure partitions, ceilings and wall furring, in class "A," "B" and "C" buildings, and exterior stucco jobs, furnishing the only plaster-board known in lengths up to 12 feet, eliminating horizontal joints.

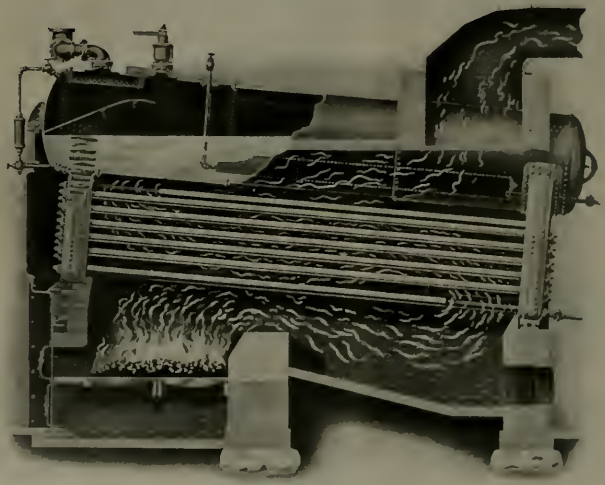
See our display at Building Material Exhibit, 77 O'Farrell street, showing Keyhold Lath "Standard," "Fireproofed," "Waterproofed" and "Wall Board."

KEYHOLD LATH COMPANY

Manufacturer's Distributors for
SCHUMACHER WALL BOARD COMPANY
251-255 Monadnock Building, San Francisco. 'Phone Douglas 3472.

The FRANKLIN Water-Tube Boiler

COMPLYING WITH THE CALIFORNIA CODE



DESCRIPTION

Your Attention Invited

Safety Under High Pressure through proper choice of materials.

Unimpeded Circulation through correct design.

High Furnace Temperature, resulting in complete combustion.

Heating Surface properly disposed to absorb heat.

Easy Cleaning and Inspection from outside front and rear.

Hand-Hole Plate Joints lightened by internal pressure.

Method of Support, ideal for contraction and expansion.

Many Other Meritorious Features

INSTALLATIONS

YOUR INSPECTION INVITED

Y. M. C. A. Building, S. F.	3—104 H.P.	312 H.P.
St. Luke's Hospital, S.F.	2—150 H.P.	300 H.P.
St. Mary's Hospital, S. F.	2—135 H.P.	270 H.P.
University of Cal. Hospital, S. F.	2—165 H.P.	330 H.P.
Examiner Building, S. F.	2—119 H.P.	238 H.P.
Whitney Building, S. F.	2—143 H.P.	286 H.P.
Hotel Del Monte, Monterey	1—220 H.P.	220 H.P.
Shattuck Hotel, Berkeley	2— 90 H.P.	180 H.P.
Cal. Paper & Bd. Mills, Antioch	2—270 H.P.	540 H.P.
Cal. Paper & Bd. Mills, Antioch	3—190 H.P.	570 H.P.
Western Meat Co., S. F.	2—104 H.P.	208 H.P.
Oakland Meat Co., Oakland	1—143 H.P.	143 H.P.
Belmont School, Belmont	1—104 H.P.	104 H.P.
St. Joseph's Home	2—104 H.P.	208 H.P.
D. Ghiradelli & Co., S. F.	1—152 H.P.	152 H.P.
Rialto Bldg., S. F.	1—135 H.P.	135 H.P.
Fairmont Hotel, S. F.	2—104 H.P.	208 H.P.
Total		4104 H.P.

Send for Catalog "E"

SELLING AGENTS

GENERAL MACHINERY & SUPPLY CO.

39-51 Stevenson Street, San Francisco, Cal.

RELIANCE
BALL BEARING DOOR HANGERS

In specifying Reliance, you are buying service at a low cost rather than equipment at a high price.

Reliance Hangers are free from complicated mechanism or an excess of cumbersome material and parts. The economies they insure in service and even in the very installation are attributable to their utter simplicity. They are easy running, and made for doors of varying types and sizes. Their physical and mechanical excellence both merits a fair price and guarantees a low-cost service.

Note Simplicity

Write for data covering the several points of merit peculiarly Reliance

Reliance Ball Bearing Door Hanger Co.
70 E. 45th St., *Grand Central Terminal,* New York

VENEERED PANELS

Elm
Gum
Oak
Mahogany
Oregon Pine

FLOORING

T. & G. Oak
"Tofco"
Brand
T. & G.
Maple
"Wolverine"
Brand

LUMBER

Ash
Birch
White Cedar
Hickory
Plain Oak
Maple
Gum
Poplar
Mahogany
Red Gum
Spruce
Walnut
Quartered
Oak

Walls finished with Cabot's Old Virginia White
Roof finished with No. 3½ Dark Gray Creosote Stain
Walter Boschen, Architect, St. Joseph, Mo.

The Latest Country-house Color-schemes

An especially appropriate and harmonious exterior color-treatment has been developed for the dignified and beautiful type of country-house that our leading architects have now firmly established, in place of the fifty-seven varieties that have prevailed in recent years.

Cabot's Old Virginia White, for the walls

Cabot's Creosote Stains, in greens or dark gray, for the roofs

The soft, brilliant "whitewash white" of the Old Virginia White is particularly suitable for this type of house, and the rich greens and velvety dark gray stains harmonize perfectly for the roof, with the old New England dark green blinds.

Samples and information sent on request

SAMUEL CABOT, Inc., Mfg. Chemists, Boston, Mass.

Cabot's Creosote Stains, Stucco and Brick Stains, "Quilt," Damp-proofing, Conservo Wood Preservative, etc., etc.

Pacific Building Materials Co., San Francisco
Mathews Paint Company, Los Angeles
S. W. R. Daily, Seattle
Timms, Cress & Co., Portland

COURTEOUS CONTINUOUS PACIFIC GAS AND ELECTRIC COMPANY RELIABLE

GAS IS THE CLEANEST AND

MOST EFFICIENT FUEL

A MATCH AND

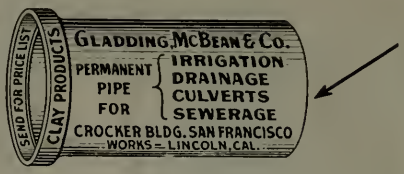
"PACIFIC SERVICE"

WILL GIVE YOU

CONTINUOUS SERVICE

Pacific Gas and Electric Company

San Francisco District
445 Sutter Street, San Francisco, Cal.



RAYMOND GRANITE COMPANY

Incorporated

Owning and operating at Knowles, Madera County, the largest Quarry in the world.

CONTRACTORS FOR STONE WORK

OF EVERY DESCRIPTION

Designers and Manufacturers of Exclusive Monuments and Mausoleums.

Main Office and Yard:

Number 1 and 3 Potrero Avenue, - SAN FRANCISCO, CALIFORNIA.

Also at Number 612-614 Homer Laughlin Building, Los Angeles.

SARATOGA CRUSHED ROCK COMPANY

CONCRETE ROCK AND CLEAN SHARP SAND

CRUSHED, WASHED, AND SCREENED, AND IN ANY AGGREGATE DESIRED.

SPECIALLY PREPARED SELF-BINDING ROCK FOR ROADS, WALKS AND DRIVEWAYS

Low freight rates to Los Altos, Palo Alto, and all points on Peninsular Railway.
The quarry is equipped with one of the most modern plants.
Large production—Excellent railroad facilities—Good service assured.

Quarry: Saratoga, Santa Clara Co.

BAKER-MACDONALD CO., Managers
703 First National Bank Building, SAN JOSE. Phone S.J.4620

S. F. Metal Stamping Works

THEOPHILE LAHAYE

ORNAMENTAL and PLAIN Stamped, Spun, Hammered and Cast METAL

2269 FOLSOM ST. Phone Mission 2421 SAN FRANCISCO

Architects' Specification Index

(For Index to Advertisements, see next page)

ACOUSTICAL CORRECTION

H. W. Johns-Manville Co., Second and Howard Sts., San Francisco.

ARCHITECTURAL SCULPTORS, MODELING, ETC.

G. Rognier & Co., 233 R. R. Ave., San Mateo.

A. F. Swoboda, modeler, 204 Second St., San Francisco.

ARCHITECTURAL TERRA COTTA

Gladding, McBean & Company, Crocker Bldg., San Francisco.

ASBESTOS ROOFING

H. W. Johns-Manville Company, San Francisco, Los Angeles, San Diego, Sacramento.

AUTOMATIC SPRINKLERS

Scott Company, 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

AWNINGS

W. A. Plummer Mfg. Co., Pine and Front Sts., San Francisco.

BANK FIXTURES AND INTERIORS

Fink & Schindler, 218 13th St., San Francisco.

A. J. Forbes & Son, 1530 Filbert St., San Francisco.

C. F. Weber & Co., 365 Market St., San Francisco.

Home Mfg. Co., 543 Brannan St., San Francisco.

Rucker-Fuller Desk Co., 677 Mission St., San Francisco.

T. H. Meek Co., 1130 Mission St., San Francisco.

Mullen Manufacturing Co., 20th and Harrison Sts., San Francisco.

BLACKBOARDS

C. F. Weber & Co., 365 Market St., San Francisco.

Beaver Blackboards and Greenboards, Rucker-Fuller Desk Company, Coast agents, 677 Mission St., San Francisco, Oakland and Los Angeles

BOOK BINDERS AND PRINTERS

Hicks-Judd Company, 51-65 First St., San Francisco.

BOILERS

"Franklin" water tube boiler, sold by General Machinery and Supply Co., 37 Stevenson St., San Francisco.

BRASS GOODS, CASTINGS, ETC.

H. Mueller Manufacturing Co., 589 Mission St., San Francisco.

BRICK—PRESSED, PAVING, ETC.

Gladding, McBean & Company, Crocker Bldg., San Francisco.

Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

Livermore Brick Company, pressed, glazed and enameled, etc., Livermore, Cal.

United Materials Co., Crossley Bldg., San Francisco.

California Brick Company, Niles, Cal.

BRICK AND CEMENT COATING

Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

Wadsworth, Howland & Co., Inc. (See Adv. for Pacific Coast Agents.)

Paraffine Paint Co., 34 First St., San Francisco.

R. N. Nason & Co., 151 Potrero Ave., San Francisco.

BRICK STAINS

Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

BUILDERS' HARDWARE

Bennett Bros., agents for Sargent Hardware, 514 Market St., San Francisco.

Pacific Hardware & Steel Company, San Francisco, Oakland, Berkeley, and Los Angeles.

BUILDING MATERIAL, SUPPLIES, ETC.

Pacific Building Materials Co., 523 Market St., San Francisco.

C. Jorgensen, Crossley Bldg., San Francisco.

Richard Spencer, Hearst Bldg., San Francisco.

The Howard Company, First and Market Sts., Oakland.

James P. Dwan, 1113 Hearst Bldg., San Francisco.

CEMENT

Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market street, San Francisco.

"Golden Gate" Brand, manufactured by Pacific Portland Cement Co., Pacific building, San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT

Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See distributing agents in advertisement.)

Armorite, sold by W. P. Fuller & Co., all principal Coast cities.

Imperial Waterproofing, manufactured by Imperial Co., 183 Stevenson St., San Francisco.

Paraffine Paint Co., 34 First St., San Francisco.

CEMENT EXTERIOR FINISH

Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents in adv.)

Concreta, sold by W. P. Fuller & Co., all principal Coast cities.

"GRANT CONCRETE MIX" The only properly proportioned mix in this market. Composed of hard, clean, fresh-water gravel, free from sand stone, and contains about 25% of crushed rock and necessary amount of sand.

WE GUARANTEE LESS THAN 25% VOIDS.

Used on many important first-class buildings and road work. Accepted on all City, State and U. S. Government work.

GRANT GRAVEL COMPANY

FLATIRON BLDG., Phone Sutter 1582, SAN FRANCISCO

An Index to the Advertisements

	Page
American Art Metal Works	26
American Concrete Co	149
American Mail Chute	30
American Marble & Mosaic Co.	36
American Rolling Mill	125
American Standard Oil Burner	144
Arlett, Arthur	148
Art Wall Paper Co	142
Asbestos Protected Metal Co.	117
Atlas Heating & Ventilating Co.	128
Austin Cube Mixer	141
Aylsworth Agencies Co	135
Bacon, Ed. R	118
Baker-MacDonald Co	6
Barrett & Hilp	128
Bass-Hueter Co	3rd Cover
Bennett Bros	145
Bergren & Son, L. G	123
Berry Bros	139
Bigley, Albert S	30
Biturine Company	36
Boggs, Pred H	147
Bos, Geo. A	149
Bowser & Co., S. F	131
Boxton & Son, Geo. W	151
Brady, A. P	133
Brininstool Co	22
Building Material Exhibit	26
Burlington Venetian Blind Co.	34
Butte Engineering Co	115
Buttonlath	20
Cabot, Samuel (Inc.)	5
California Artistic Metal and Wire Co	32
California Brick Co	19
California Bldg. Material Co.	141
California Granite Co	145
California Photo Engraving Co.	144
California Plumbing Supply Co.	18
Capitol Sheet Metal Works	142
Carnahan & Mulford	145
Central Iron Works	32
Channing, John	129
Childs, Nell T	124
City of Paris	147
Coleman, Alex	144
Colorado-Yule Marble Co	129
Concrete Engineering Co	147
Construction & Engineering Co.	151
Cook Belting Co	27
Costello, J. T. Co	147
Courtney, G. W	123
Cowell Lime & Cement Co	141
Crane Co	34
Crowe, J. B	123
Cutler Mail Chute Co	30
Denison Block Co	137
Dieckmann Hardwood Co	121
Dioguardi & Terranova	128
Dougan, J. M	151
Dudfield Lumber Co	15
Duncan, W. C	144
Dunham, C. A., Co	35
Dunn, Neil H	123
Dwan, Jos. P	117
Dyer Bros	121
Eaton, W. L	11
Elam & Son	145
Ellery Arms Co	134
Fair Manufacturing Company	32
Falvy, A	31
Farrell & Reed	146
Fenestra Steel Sash	7
Fess System Co	34
Fick Bros	136
Fidelity & Casualty Co. of N.Y.	147
Fidelity & Deposit Co of Maryland	147
Fink & Schindler Co., The	142
Fish Fuel System	136
Flagg, Edwin H., Scenic Co	145
Forbes & Son	134
Foster Vogt Co	145
Foxcroft Bldg	132
Fuller, W. P. Co	152
General Gas Light Co	24
General Machinery & Supply Co.	3
Germanwood Floor Co	123
Gilley-Schmid Co	144
Gladding, McBean & Co	6
Glauber Brass Mfg. Co	18
Globe Indemnity Co	147
Golden Gate Decorating Co	134
Golden Gate Ornamental Iron Co	32
Goodyear Rubber Co	25
Goold & Johns	117
Grace & Bernieri	128
Grant Gravel Co	7
Grant Rock & Gravel Co	146
Haines, Jones & Cadbury	128
Hammond, M. E	143
Hannah, J. D	149
Hauser Reversible Window	1
Hicks-Judd Co	136
Hillard, C. J., Co	33
Hipolito Screen Co	34
Holbrook, Merrill & Stetson	126
Home Mfg. Co	145
Hooper Lumber Co	35
Hoosier Mfg. Co., The	28
Houghton Construction Co	149
Howard Company	123
Hughson & Merton Co	144
Hunt, Robt. W. & Co	141
Hunter & Hudson	133
Hurley Co., J. C	142
Ideal Heating Co	117
Illinois Engineering Co	35
Imperial Waterproofing Co	23
Improved Sanitary Fixture Co.	23
Jackson Sidewalk Lights	14
James & Drucker	133
Jarvis, T. P	35
Johns-Manville Co	23
Johnson Service Co	2
Jorgensen, C	117
Judson Mfg. Co	31
Key-Hold Lath Co	2
Kinnear Mfg. Co	36
Kissel, I. R	142
Klyce, Harvey A	151
Knowles & Mathewson	146
Kohler Co	113
Lange & Bergstrom	148
Larsen & Bro	128
Larsen, Sampson & Co	151
Lawton & Vezey	146
Lettich, A	146
Livermore Fire Brick Works	19
Los Angeles Pressed Brick Co.	29
Ludwig, H. T	151
MacGruer & Co	142
Magner Bros	134
Mark-Lally Co	123
Masow & Morrison	151
Mangrum & Otter	138
Marshall & Stearns Co	22
Master Builders	120
McClenahan, S. P	143
McElhinney Tile Co	12
McGilvray Stone Co	133
MacRorie-McLaren Co	151
Meese & Gottfried	124
Miller-Enwright Co	146
Modern Appliance Co	127
Monk, John	133
Monson Bros	149
Montague, P	16
Morehouse, C. C	148
Mortenson Construction Co	32
Mott Iron Works	18
Mullen Mfg. Co	117
Mueller, H., Mfg. Co	133
Municipal Engineering Co	141
Musto Sons Keenan Co	13
Nason, R. N. & Co	12
Nathan, Dohrmann Co	144
National Mill & Lumber Co	17
National Surety Co	134
Ne Page, McKenny Co	117
Newbery Electric Co	147
New York Belting Co	119
Niles Sand Gravel & Rock Co.	36
Norris Co., L. A	22
O'Hara & Livermore	143
Oak Flooring Service Bureau	25
Otis Elevator Co	Back Cover
Pacific Blower & Heating Co.	117
Pacific Building Materials Co.	31
Pacific Coast Paint Corp'n	138
Pacific Coast Steel Company	27
Pacific Fire Extinguisher Co.	115
Pacific Gas & Electric Co	5
Pacific Hardware and Steel Co.	144
Pacific Imp. Co	17
Pacific Mfg. Co	145
Pacific Porcelain Ware Co.	2d Cover
Pacific Rolling Mills	33
Palm Iron Works	31
Palmer & Petersen	149
Paraffine Paint Co	Back Cover
Perfection Disappearing Bed Co	125
Perry, Geo. H	140
Phillips, Chas. T	124
Pioneer Paper Co	9
Pitcher Door Hanger	17
Pittsburg Water Heater	131
Plummer, W. A. Mfg. Co	1
Pope & Talbot	138
Portland Lumber Co	15
Pratt Building Material Co	132
Prometheus Electric Co	143
Ralston Iron Works	33
Ray, W. S. Mfg. Co. Inc	27
Raymond Granite Co	6
Reliance Ball-Bearing Door Hanger	4
Rigney Tile Co	134
Rix Compressed Air Co	23
Roberts Mfg. Co	115
Robertson & Hall	147
Rognier & Co	24
Rucker-Fuller Desk Co	129
S. F. Metal Stamping Works	6
S. F. Pioneer Varnish Wks.	3d Cover
Saratoga Rock Co	6
Schaw-Batcher Co	21
Scott Co	128
Schreiber & Sons Co	31
Schrader Iron Works	32
Sierra Electric Constr. Co	9
Simonds Machinery Co	134
Simpson & Stewart	34
Sloan Valve Co	18
Southern California Iron and Steel Co	32
Spencer Elevator Co	11
Spencer, Richard	146
Spencer Turbine Cleaner	144
St. Francis Hotel	26
Standard Elec. Con. Co	115
Standard Varnish Co	139
Stockholm & Allyn	146
Strable Mfg. Co	4
Sunset Lumber Company	15
Teichert & Ambrose	142
Tittle, H. S	134
Tormey Co	133
Trost, Robt	128
Uhl Bros	123
United Lumber Co	15
United Materials Co	29
U. S. Metal Products Co	138
U. S. Steel Products Co	150
Van Emon Elevator Co	136
Van Fleet-Freear Co	10
Vitrolite Construction Co	21
Vermont Marble Co	24
Wadsworth Howland	116
Ward, P. R	123
Walter, D. N. & E. & Co	10
Weber, C. P. & Co	2, 20
West Coast Wire & Iron Works	32
Western Blind & Screen Co.	20
Western Iron Works	33
Western Pacific	24
Western Vacuum Supply Co.	129
Whitcomb Hotel	132
White Bros	112
Williams Bros. & Henderson	148
Wilson, W. F. Co	142
Wold, C. L., Co	143
Woods, Huddart & Gunn	27
Zelinsky, D. & Sons	149

Roofing?

Don't take chances on inferior material. Buy the old reliable **Pioneer**

SPECIFY AND INSIST ON "PIONEER ROOFING"

PIONEER PAPER CO., Manufacturers **506-507 Hearst Bldg., San Francisco** Telephone Kearny 3788

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CEMENT EXTERIOR FINISH—Continued
Pacific Building Materials Co., 523 Market St.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents in adv.)
Fuller's Concrete Floor Enamel, made by W. P. Fuller & Co., San Francisco.

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CHURCH INTERIORS
Fink & Schindler, 218 13th St., San Francisco.

CHUTES—SPIRAL
Haslett Warehouse Co., 310 California St., San Francisco.

COLD STORAGE PLANTS
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

COMPOSITION FLOORING
Germanwood Floor Co., 1621 Eddy St., San Francisco.
"Vitrolite," Vitrolite Construction Co., 34 Davis St., San Francisco.

COMPRESSED AIR MACHINERY
General Machinery & Supply Co., 39 Stevenson St., San Francisco.

COMPRESSED AIR CLEANERS
Spencer Turbine Cleaner. Sold by Hughson & Merton, 530 Golden Gate Ave., San Francisco.
Western Vacuum Supply Co., 1125 Market St., San Francisco.

CONCRETE CONSTRUCTION
American Concrete Co., Humboldt Bank Bldg., San Francisco.
Clinton Construction Co., 140 Townsend street, San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Palmer & Petersen, Monadnock Bldg., San Francisco.

CONCRETE HARDNER
Master Builders Method, represented in San Francisco by C. Roman, Sharon Bldg.

CONCRETE MIXERS
Austin Improved Cube Mixer. J. H. Hansen & Co., California agents, 508 Balboa Bldg., San Francisco.
Foote Mixers. Sold by Edw. R. Bacon, 40 Natoma St., San Francisco.

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Twisted Bars. Sold by Woods, Huddart & Gunn, 444 Market St., San Francisco.
Clinton Welded Wire Fabric, L. A. Norris Co., 140 Townsend St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Southern California Iron and Steel Company, Fourth and Mateo Sts., Los Angeles.
Triangle Mesh Fabric. Sales agents, Pacific Building Materials Co., 523 Market St., San Francisco.

CONCRETE SURFACING
"Concreta." Sold by W. P. Fuller & Co., San Francisco.
Wadsworth, Howland & Co.'s Bay State Brick and Cement Coating. Sold by Jas. Hambly Co., Pacific Bldg., San Francisco, and Los Angeles.

CONTRACTOR'S BONDS
Bonding Company of America, Kohl Bldg., San Francisco.
Globe Indemnity Co., 120 Leidesdorff St., San Francisco.
Fred H. Boggs, Foxcroft Bldg., San Francisco.
National Surety Co. of N. Y., 105 Montgomery St., San Francisco.
Fidelity & Casualty Co. of New York, Merchants Exchange Bldg., San Francisco.
Fidelity & Deposit Co. of Maryland, Insurance Exchange, San Francisco.
J. T. Costello Co., 216 Pine St., San Francisco.
Robertson & Hall, First National Bank Bldg., San Francisco.

CONTRACTORS, GENERAL
Arthur Arlett, New Call Bldg., San Francisco.
Farrell & Reed, Gunst Bldg., San Francisco.
American Concrete Co., Humboldt Bank Bldg., San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Carnahan & Mulford, 45 Kearny St., San Francisco.
Houghton Construction Co., Hooker & Lent Bldg., San Francisco.
Geo. H. Bos, Hearst Bldg., San Francisco.
Larsen, Sampson & Co., Crocker Bldg., San Francisco.
J. D. Hannah, 725 Chronicle Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
Dioguardi & Terranova, Westbank Bldg., San Francisco.
Teichert & Ambrose, Ochsner Bldg., Sacramento.
L. G. Bergren & Son, Call Bldg., San Francisco.
Grace & Bernieri, Claus Spreckels Bldg., San Francisco.
Geo. W. Boxton & Son, Hearst Bldg., San Francisco.
W. C. Duncan & Co., 526 Sharon Bldg., San Francisco.
A. P. Brady, Humboldt Bank Bldg., San Francisco.
Harvey A. Klyce, New Call Bldg., San Francisco.
Knowles & Mathewson, Call Bldg., San Francisco.
C. L. Wold Co., 75 Sutter St., San Francisco.
P. R. Ward, 981 Guerrero St., San Francisco.
Lange & Bergstrom, Sharon Bldg., San Francisco.
Foster Vogt Co., 411 Sharon Bldg., San Francisco.
T. H. Goodwin, 110 Jessie St., San Francisco.
Thos. Elam & Son, Builders Exchange, San Francisco.
Masow & Morrison, 518 Monadnock Bldg., San Francisco.
Lawton & Vezey, 906 Plaza Bldg., Oakland.

Phone SUTTER 2297 H. H. VAN LUVEN, Manager

SIERRA ELECTRIC CONSTUCTION CO.

TELEPHONE ENGINEERS

619 CALL BUILDING SAN FRANCISCO, CAL.

MAS-OLEUM FLOORING (A Mastic Linoleum)
DUSTLESS, SEAMLESS, WATERPROOF, ACID and ALKALI PROOF
VAN FLEET - FREEAR COMPANY, Agents
Telephone Douglas 1227 120 JESSIE STREET, SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONTRACTORS, GENERAL—Continued
Monson Bros., 502 Clunie Bldg., San Francisco.
J. M. Dougan Co., Hearst Bldg., San Francisco.
Palmer & Peterson, Monadnock Bldg., San Francisco.
Robert Trost, Twenty-sixth and Howard Sts., San Francisco.
John Monk, Sheldon Bldg., San Francisco.
Williams Bros. & Henderson, 381 Tenth St., San Francisco.

CONVEYING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CORK TILING, FLOORING, ETC.
David Kennedy, Inc., Sharon Bldg., San Francisco.
Be-ver Cork Tile. Sold by W. L. Eaton & Co., 812 Santa Marina Bldg., San Francisco.

CORNER BEAD
Capitol Art Metal Works, 1927 Market St., San Francisco.
United States Metal Products Co., 555 Tenth St., San Francisco; 750 Keller St., San Francisco.

CORK TILE AND INSULATION
Van Fleet-Freear Co., 120 Jessie St., San Francisco.

CRUSHED ROCK
Grant Gravel Co., Flatiron Bldg., San Francisco.
California Building Material Company, new Call Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., San Francisco.
Pratt Building Material Co., Hearst Bldg., San Francisco.
Saratoga Rock Company, Baker-MacDonald Co. representatives, First National Bank Bldg., San Jose.

DAMP-PROOFING COMPOUND
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Biturine Co., 24 California St., San Francisco.
Imperial Co., 183 Stevenson St., San Francisco.
"Pabco" Damp-Proofing Compound, sold by Paraffine Paint Co., 34 First St., San Francisco.
Wadsworth, Howland & Co., Inc., 84 Washington St., Boston. (See Adv. for Coast agencies.)

DOOR HANGERS
McCabe Hanger Mfg. Co., New York, N. Y.
Pitcher Hanger, sold by National Lumber Co., 326 Market St., San Francisco.
Reliance Hanger, sold by Sartorius Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Columbia Wire & Iron Works, Portland, Ore.

DRAIN BOARDS, SINK BACKS, ETC.
Germanwood Floor Co., 1621 Eddy St., San Francisco.

DRINKING FOUNTAINS
Haws Sanitary Fountain, 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.

DRINKING FOUNTAINS—Continued
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 173 Beale St., San Francisco.
M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELECTRICAL CONTRACTORS
Butte Engineering Co., 683 Howard St., San Francisco.
Goold & Johns, 113 S. California St., Stockton, Cal.
NePage, McKenny Co., 149 New Montgomery St., San Francisco.
Newbery Electrical Co., 413 Lick Bldg., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
H. S. Tittle, 245 Minna St., San Francisco.
Standard Electrical Construction Company, 60 Natoma St., San Francisco.

ELECTRICAL ENGINEERS
Chas. T. Phillips, Pacific Bldg., San Francisco.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 126 Beale St., San Francisco.
Van Emon Elevator Co., 54 Natoma St., San Francisco.

ENGINEERS
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

FIRE ESCAPES
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE EXTINGUISHERS
Scott Company, 243 Minna St., San Francisco
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

FIREPROOFING AND PARTITIONS
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

FIXTURES—BANK, OFFICE, STORE, ETC.
T. H. Meek & Co., 1130 Mission St., San Francisco.
Mullen Manufacturing Co., 20th and Harrison Sts., San Francisco.
The Fink & Schindler Co., 218 13th St., San Francisco.
A. J. Forbes & Son, 1530 Filbert St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

D. N. & E. WALTER & CO.
"SINCE 1858"
LINOLEUMS—CARPETS LARGE STOCKS CARRIED
Estimates furnished on request
100 STOCKTON STREET SAN FRANCISCO

"BE-VER" CORK TILING

Artistic = Quiet = Durable

MADE IN A WIDE RANGE OF COLORS — MODERATE IN PRICE.

W. L. EATON & CO., Agents

112 Market St., San Francisco Telephone Garfield 372

See sample installation at The Building Material Exhibit, 77 O'Farrell Street

ARCHITECTS' SPECIFICATION INDEX—*Continued*

FLOOR TILE
New York Belting and Packing Company, 519 Mission St., San Francisco.
W. L. Eaton & Co., 112 Market St., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
R. N. Nason & Co., San Francisco and Los Angeles.

FLOORS—COMPOSITION
"Vitrolite," for any structure, room or bath. Vitrolite Construction Co., 1490 Mission St., San Francisco.
Germanwood Floor Co., 1621 Eddy St., San Francisco.

FLOORS—HARDWOOD
Oak Flooring Bureau, Conway Bldg., Chicago, Ill.
Strable Mfg. Co., 511 First St., Oakland.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.

FURNACES—WARM AIR
Miller-Enwright Co., 907 Front St., Sacramento.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co., 612 Howard St., San Francisco.
Rix Compressed Air and Drill Company, First and Howard Sts., San Francisco.

GARBAGE CHUTES
Bradshaw Sanitary Garbage Chute, Aylsworth Agencies Co., 591 Mission St., San Francisco, sole agents for California.

GAS GRATES
General Gas Light Co., 768 Mission St., San Francisco.

GLASS
W. P. Fuller & Company, all principal Coast cities.
Whittier, Coburn Co., Howard and Beale Sts., San Francisco.

GRADING
P. Montague Co., 110 Jessie St., San Francisco.

GRANITE
California Granite Co., Sharon Bldg., San Francisco.
McGilvray-Raymond Granite Co., 634 Townsend St., San Francisco.
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.

GRAVEL AND SAND
California Building Material Co., new Call Bldg., San Francisco.
Del Monte White Sand, sold by Pacific Improvement Co., Crocker Bldg., San Francisco

GRAVEL AND SAND—Continued
Pratt Building Material Co., Hearst Bldg., San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
Grant Rock & Gravel Co., Cory Bldg., Fresno.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., 704 Market St., San Francisco.
Saratoga Rock Company, 703 First National Bank Bldg., San Jose.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.
Empire Plaster sold by Pacific Portland Cement Co., Pacific Bldg., San Francisco.

HARDWARE
Pacific Hardware & Steel Company, representing Lockwood Hardware Co., San Francisco.
Sargent's Hardware, sold by Bennett Bros., 514 Market St., San Francisco.

HARDWOOD LUMBER—FLOORING, ETC.
Dieckmann Hardwood Co., Beach and Taylor Sts., San Francisco.
Parrott & Co., 320 California St., San Francisco.
White Bros., cor. Fifth and Brannan Sts., San Francisco.
Strable Mfg. Co., 511 First St., Oakland.

HEATERS—AUTOMATIC
Pittsburg Water Heater Co., 478 Sutter St., San Francisco.

HEATING AND VENTILATING
Gilley-Schmid Company, 198 Otis St., San Francisco.
Mangrum & Otter, Inc., 507 Mission St., San Francisco.
Charles T. Phillips, Pacific Bldg., San Francisco.
James & Drucker, 450 Hayes St., San Francisco.
J. C. Hurley Co., 509 Sixth St., San Francisco.
Illinois Engineering Co., 563 Pacific Bldg., San Francisco.
Neil H. Dunn, 786 Ellis St., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
Scott Company, 243 Minna St., San Francisco.
C. A. Dunham Co., Wells Fargo Bldg., San Francisco.

HEAT REGULATION
Johnson Service Company, 149 Fifth St., San Francisco.

HOLLOW BLOCKS
Denison Hollow Interlocking Blocks, Forum Bldg., Sacramento, and the Howard Company, Oakland.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.
Pratt Building Material Co., Hearst Bldg., San Francisco

MADE IN SAN FRANCISCO

PASSENGER and FREIGHT ELEVATORS

INVESTIGATE OUR PRODUCT

SPENCER ELEVATOR COMPANY

126-128 Beale Street, SAN FRANCISCO Phone Kearny 664

McELHINNEY TILE CO.

Contractors for

FLOOR, WALL AND MANTEL TILE

1097 Mission Street, San Francisco — Park 6986

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HOLLOW METAL DOORS AND TRIM
Edwin C. Dehn, 525 Hearst Bldg., San Francisco, representing Interior Metal Mfg. Co., and Dahlstrom Metallic Door Company, Jamestown, N. Y.

HOSPITAL EQUIPMENT
Sierra Electric Construction Company.

HOSPITAL FIXTURES
J. L. Mott Iron Works, 135 Kearny St., San Francisco.

HOTELS
St. Francis Hotel, Union Square, San Francisco
Hotel Whitcomb, facing Civic Center, San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and Monadnock Bldg., San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INTERIOR DECORATORS
Mrs. H. C. McAfee, 504 Sutter St., San Francisco.
Albert S. Bigley, 344 Geary St., San Francisco.
City of Paris, Geary and Stockton Sts., San Francisco.
A. Falvy, 578 Sutter St., San Francisco.
The Tormey Co., 681 Geary St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
O'Hara & Livermore, Sutter St., San Francisco.

KITCHEN CABINETS
Western Equipment Co., Building Material Exhibit, 77 O'Farrell St., San Francisco.
Hoosier Cabinets, branch 1067 Market St., San Francisco.

LANDSCAPE ARCHITECTS
Neil T. Childs Co., 68 Post St., San Francisco.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 135 Kearny St., San Francisco.
Ralston Iron Works, 20th and Indiana Sts., San Francisco.

LANDSCAPE GARDENERS
MacRorie-McLaren Co., 141 Powell St., San Francisco.

LATHING MATERIAL
"Buttonlath," manufactured by Buttonlath Mfg. Co., office, Building Material Exhibit, San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co., 445 Sutter St., San Francisco.
The Fish Fuel System, 50 Eighth St., San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
D. N. & E. Walter & Co., O'Farrell and Stockton Sts., San Francisco.

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.
Hooper Lumber Co., Seventeenth and Illinois Sts., San Francisco.
Portland Lumber Co., 16 California St., San Francisco.
Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
Pope & Talbot, foot of Third St., San Francisco.
Sunset Lumber Co., Oakland, Cal.
United Lumber Company, 687 Market St., San Francisco.

MAIL CHUTES
Cutler Mail Chute Co., Rochester, N. Y. (See adv. on page 30 for Coast representatives.)
American Mailing Device Corp., represented on Pacific Coast by U. S. Metal Products Co., 555 Tenth St., San Francisco.

MANTELS
Mangrum & Otter, 561 Mission St., San Francisco.

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
Sculptors' Workshop, S. Miletin & Co., 1705 Harrison St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.

METAL CEILINGS
San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

METAL DOORS AND WINDOWS
U. S. Metal Products Co., 555 Tenth St., San Francisco.
Capitol Art Metal Works, 1927-1935 Market St., San Francisco.

METAL FURNITURE
Capitol Art Metal Works, 1927-1935 Market St., San Francisco.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
Edwin C. Dehn, Manufacturer's Agent, Hearst Bldg., San Francisco.

MILL WORK
Dudfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218 13th St., San Francisco.

OIL BURNERS
American Standard Oil Burner Company, Seventh and Cedar Sts., Oakland.
S. T. Johnson Co., 1337 Mission St., San Francisco.
T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., San Francisco.
Fess System, 220 Natoma St., San Francisco.
W. S. Ray Mfg. Co., 218 Market St., San Francisco.

NASON'S OPAQUE FLAT FINISH A FLAT, WASHABLE OIL PAINT, made in soft Kalsomine tints—a practical article for WALLS, CEILINGS, Etc. Economical and Durable. Agency TAMM & NOLAN COMPANY'S high grade Varnishes and Finishes, made on the Pacific Coast to stand our climatic conditions.

R. N. NASON & CO., Paint Makers —— PORTLAND SEATTLE LOS ANGELES

151 Potrero Ave.—SAN FRANCISCO—54 Pine Street

CLARENCE E. MUSTO. Pres. JOSEPH B. KEENAN. Vice-Pres. GUIDO J. MUSTO. Sec'y & Treas.

JOSEPH MUSTO SONS-KEENAN CO.

Phone Franklin —6365— **MARBLE**

OFFICE AND MILLS: 535-565 North Point St., SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE
- American Art Metal Works, 13 Grace St., San Francisco.
- California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
- Fair Manufacturing Company, 617 Bryant St., San Francisco.
- Palm Iron & Bridge Works, Sacramento.
- Ralston Iron Works, 20th and Indiana Sts., San Francisco.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
- Schreiber & Sons Co., represented by Western Builders Supply Co., San Francisco.
- Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
- West Coast Wire & Iron Works, 861-863 Howard St., San Francisco.

PAINT FOR CEMENT
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.) (See adv. in this issue for Pacific Coast agents.)
- Fuller's Concreta for Cement, made by W. P. Fuller & Co., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
- Berry Bros., 250-256 First St., San Francisco.
- Biturine Company, 24 California St., San Francisco.
- Pacific Coast Paint Corp'n, Security Bank Bldg., Oakland.
- Paraffine Paint Co., 34 First St., San Francisco.
- Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.

PAINTING, TINTING, ETC.
- Art Wall Paper Co., 508 Ellis St., San Francisco
- Golden Gate Decorating Co., 704 Polk St., San Francisco.
- I. R. Kissel, 1747 Sacramento St., San Francisco.
- D. Zelinsky & Sons, San Francisco and Los Angeles.
- The Tormey Co., 681 Geary St., San Francisco.
- Fick Bros., 475 Haight St., San Francisco.

PAINTS, OILS, ETC.
- The Brininstool Co., Los Angeles, the Haslett Warehouse, 310 California St., San Francisco.
- Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco.
- Berry Bros., 250-256 First St., San Francisco.
- Biturine Co., 24 California St., San Francisco
- Pacific Coast Paint Corp'n, Security Bank Bldg., Oakland.
- Whittier, Coburn Co., Howard and Beale Sts., San Francisco.
- Magner Bros., 419-421 Jackson St., San Francisco.
- R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
- W. P. Fuller & Co., all principal Coast cities.
- Standard Varnish Works, 55 Stevenson St., San Francisco.

PANELS AND VENEER
- White Bros., Fifth and Brannan Sts., San Francisco.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA
- Gladding, McBean & Co., Crocker Bldg., San Francisco.

PLASTER CONTRACTORS
- C. C. Morehouse, Crocker Bldg., San Francisco.
- MacGruer & Co., 180 Jessie St., San Francisco.
- M. J. Terranova, Westbank Bldg., San Francisco.

PLASTER EXTERIORS
- Buttonlatb, for exterior and interior plastering, Hearst Bldg., San Francisco.

PLUMBING CONTRACTORS
- Alex Coleman, 706 Ellis St., San Francisco.
- A. Lettich, 365 Fell St., San Francisco.
- Neil H. Dunn, 786 Ellis St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Scott Co., Inc., 243 Minna St., San Francisco.
- Wm. F. Wilson Co., 328 Mason St., San Francisco.

PLUMBING FIXTURES, MATERIALS, ETC.
- Crane Co., San Francisco and Oakland.
- California Steam Plumbing Supply Co., 671 Fifth St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Glauber Brass Manufacturing Company, 1107 Mission St., San Francisco.
- Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
- Improved Sanitary Fixture Co., 632 Metropolitan Bldg., Los Angeles.
- J. L. Mott Iron Works, D. H. Gulick, selling agent, 135 Kearny St., San Francisco.
- Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
- H. Mueller Manufacturing Co., Pacific Coast branch, 589 Mission St., San Francisco.
- Miller-Enwright Co., 907 Front St., Sacramento.
- Mark-Lally Co., 235 Second St., San Francisco, also Oakland, Fresno, San Jose and Stockton.
- Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
- Wm. F. Wilson Co., 328 Mason St., San Francisco.
- C. A. Dunham Co., Wells Fargo Bldg., San Francisco.
- Neil H. Dunn, 786 Ellis St., San Francisco.

POTTERY
- Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

POWER TRANSMITTING MACHINERY
- Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PUMPS
- Simonds Machinery Co., 117 New Montgomery St., San Francisco.

RADIATORS
- American Radiator Co., Second and Townsend Sts., San Francisco.

RAILROADS
- Southern Pacific Company, Flood Bldg., San Francisco.
- Western Pacific Company, Mills Bldg., San Francisco.

REFRIGERATORS
- McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton Sts., San Francisco.

REVERSIBLE WINDOWS
- Hauser Reversible Window Company, Balboa Bldg., San Francisco.
- Whitney Windows, represented by Richard Spencer, 801-3 Hearst Bldg., San Francisco.

REVOLVING DOORS
- Van Kennel Doors, sold by U. S. Metal Products Co., 525 Market St., San Francisco.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
- C. F. Weber & Co., 365 Market St., S. F.
- Kinnear Steel Rolling Door Co., Rialto Bldg., San Francisco
- Wilson's Steel Rolling Doors, U. S. Metal Products Co., San Francisco and Los Angeles

Jackson's Patent Sidewalk Lights and "No Leak" Sidewalk Doors
FIRST AND BEST
P. H. Jackson & Co. 237 - 247 FIRST ST., SAN FRANCISCO
Tel. Kearny 1959

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ROOFING AND ROOFING MATERIALS
Grant Gravel Co., Flatiron Bldg., San Francisco.
H. W. Johns-Manville Co., Second and Howard Sts., San Francisco.
Malott & Peterson, Inc., Monadnock Bldg., San Francisco.
Niles Sand, Gravel and Rock Co., Mutual Bank Bldg., San Francisco.
"Malthoid" and "Ruberoid," manufactured by Paraffine Paint Co., San Francisco.
Pioneer Roofing, manufactured by Pioneer Paper Co., 513 Hearst Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

RUBBER TILING
Goodyear Rubber Company, 587 Market St., San Francisco.
New York Belting & Rubber Company, 519 Mission St., San Francisco.

SAFETY TREADS
"Sanitread," sold by Richard Spencer, 801-3 Hearst Bldg., San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.
C. Jorgensen, Crossley Bldg., San Francisco.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co., 365 Market St., San Francisco; 512 S. Broadway, Los Angeles.
Rucker-Fuller Desk Company, 677 Mission St., San Francisco.

SCREENS
Hipolito Flyout Screens, sold by Simpson & Stewart, Dalziel Bldg., Oakland.
Watson Metal Frame Screens, sold by Richard Spencer, 801-3 Hearst Bldg., San Francisco.

SEEDS
California Seed Company, 151 Market St., San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Paraffine Paint Co., 34 First St., San Francisco.

SHEET METAL WORK, SKYLIGHTS, ETC.
Capitol Sheet Metal Works, 1927 Market St., San Francisco.
U. S. Metal Products Co., 555 Tenth St., San Francisco.

SHINGLE STAINS
Cabot's Creosote Stains, sold by Pacific Building Materials Co., Underwood Bldg., San Francisco
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SIDEWALK LIGHTS
P. H. Jackson & Co., 237-47 First St., San Francisco.
Jas. P. Dwan, Hearst Bldg., San Francisco.

STEEL TANKS, PIPE, ETC.
Schaw-Batcher Co. Pipe Works, 356 Market St., San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Dyer Bros., 17th and Kansas Sts., San Francisco.
Golden Gate Iron Works, 1541 Howard St., San Francisco.
Judson Manufacturing Co., 819 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Southern California Iron and Steel Co., Fourth and Mateo Sts., Los Angeles.
Western Iron Works, 141 Beale St., San Francisco.

STEEL PRESERVATIVES
Bay State Steel Protective Coating. (See adv. for coast agencies.)
Paraffine Paint Co., 34 First St., San Francisco.
Biturine Company, 24 California St., San Francisco.

STEEL REINFORCING
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Southern California Iron & Steel Company, Fourth and Mateo Sts., Los Angeles.
Woods, Huddart & Gunn, 444 Market St., Sao Francisco.

STEEL ROLLING DOORS
Kinnear Steel Rolling Door Co., Rialto Bldg., San Francisco.

STEEL SASH
"Fenestra," solid steel sash, manufactured by Detroit Steel Products Company, Detroit, Mich.

STEEL WHEELBARROWS
Champion and California steel brands, made by Western Iron Works, 141 Beale St., San Francisco.

STONE
California Granite Co., 518 Sharon Bldg., San Francisco.
McGilvray Stone Company, 634 Townsend St., San Francisco.

STORAGE SYSTEMS—GASOLINE, OIL, ETC.
S. F. Bowser & Co., 612 Howard St., San Francisco.
Rix Compressed Air and Drill Co., First and Howard Sts., San Francisco.

LATH, SHINGLES, SHAKES and POSTS, SASH, DOORS and MILL WORK
TIMBERS and SPECIALS KILN DRIED FINISH and FLOORING

SUNSET LUMBER COMPANY
DEALERS WHOLESALE AND RETAIL IN
PINE and REDWOOD LUMBER

PHONE OAKLAND 1820
YARDS AND OFFICE
OAK AND FIRST STS., OAKLAND, CAL.

PORTLAND LUMBER CO.

Yards { TRACY, CAL. / BRENTWOOD, CAL.
Phone KEARNY 2074

PORTLAND LUMBER COMPANY
A. J. RUSSELL, Agent
LUMBER
SIMPLEX SILOS
SAGINAW SPECIAL SHINGLES
Ship Timbers, Oil Rigs and Special Bills Cut to Order.
16 California Street San Francisco, Cal.

Millwork Manufactured
and Delivered Anywhere
Plans or Lists sent us for Estimates will have Careful and Immediate Attention
DUDFIELD LUMBER CO.
Main Office, Yard and Planing Mill - PALO ALTO
JNO. DUDFIELD, President and Manager JOSEPH A. JURY, Secretary and Mill Supt.

Phone Kearny 2080

UNITED LUMBER MILLS
Pine and Redwood Lumber
WHOLESALE AND RETAIL—ESTIMATES GIVEN
687 MARKET STREET SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—Continued

TELEPHONE AND ELECTRIC EQUIPMENT
Aylsworth Agencies Company, 591 Mission St., San Francisco.

TELEPHONE SIGNALS
Sierra Electric Construction Co.

TEMPERATURE REGULATION
Johnson Service Company, 149 Fifth St., San Francisco.

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market St., San Francisco.

TILES, MOSAICS, MANTELS, ETC.
Rigney Tile Company, Sheldon Bldg., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.
McElhinney Tile Co., 1097 Mission St., San Francisco.

TILE FOR ROOFING
Gladding, McBean & Co., Crocker Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

TILE WALLS—INTERLOCKING
Denison Hollow Interlocking Blocks, Forum Bldg., Sacramento.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

VACUUM CLEANERS
Arco Wand Cleaners, sold by American Radiator Company, Second and Townsend Sts., San Francisco.
Palm Vacuum Cleaners, sold by Western Vacuum Supply Co., 1125 Market St., San Francisco.
Spencer Turbine Cleaner, sold by Hughson & Merton, 530 Golden Gate Ave., San Francisco.

VALVES
Sloan Royal Flush Valves. T. R. Burke, Pacific Coast agent, Wells Fargo Bldg., San Francisco.
Crane Radiator Valves., manufactured by Crane Co., Second and Brannan Sts., San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
Berry Bros., 250-256 First St., San Francisco.
W. P. Fuller Co., all principal Coast cities.
Glidden Varnish Co., Cleveland, O., represented on the Pacific Coast by Whittier, Coburn Co., San Francisco.
Pacific Coast Paint Corp'n, 112 Market St., San Francisco; Security Bank Bldg., Oakland.
R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
Standard Varnish Works, San Francisco.
S. F. Pioneer Varnish Works, 816 Mission St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
Burlington Venetian Blinds, Burlington, Vt., and C. F. Weber & Co., 365 Market St., San Francisco.
Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.

WALL BEDS, SEATS, ETC.
Lachman Wall Bed Co., 2019 Mission St., San Francisco.
Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.
Peek's Wall Beds, sold by Western Equipment Co., 72 Fremont St., San Francisco.
Perfection Disappearing Bed Co., 737 Mission St., San Francisco.

WALL PAINT
Nason's Opaque Flat Finish, manufactured by R. N. Nason & Co., San Francisco, Portland and Los Angeles.
San-A-Cote and Vel-va-Cote, manufactured by the Brininstool Co., Los Angeles; Marion D. Cohn Co., Hansford Bldg., San Francisco, distributor.

WALL BOARD
"Amiwud" Wall Board, manufactured by Paraffine Paint Co., 34 First St., San Francisco.

WALL PAPER
Uhl Bros., 38 O'Farrell St., San Francisco.
The Tormey Co., 681 Geary St., San Francisco.
Art Wall Paper Co., 500 Ellis St., San Francisco.

WATER HEATERS—AUTOMATIC
Pittsburg Water Heater Co. of California, 478 Sutter St., San Francisco, and 402 Fifteenth St., Oakland.

WATERPROOFING FOR CONCRETE, BRICK, ETC.
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Biturine Company, 24 California St., San Francisco.
Hill, Hubbell & Co., 1 Drumm St., San Francisco.
H. W. Johns-Manville Co., San Francisco and principal Coast cities.
Imperial Co., 183 Stevenson St., San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Wadsworth, Howland & Co., Inc. (See adv. for Coast agencies.)

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL FINISH
"Gold Seal," manufactured and sold by Bass-Hueter Paint Company. All principal Coast cities.
"Silkenwhite," made by W. P. Fuller & Co., San Francisco.
"Satinette," Standard Varnish Works, 113 Front St., San Francisco.

WINDOWS—REVERSIBLE, CASEMENT, ETC.
Whitney Window, represented by Richard Spencer, Hearst Bldg., San Francisco.
Hauser Reversible Window Co., Balboa Bldg., San Francisco.
International Casement Co., represented by Edwin C. Dehn, Hearst Bldg., San Francisco.

WIRE FABRIC
U. S. Steel Products Co., Rialto Bldg., San Francisco.

WOOD MANTELS
Fink & Schindler, 218 13th St., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.

Residence 2887 GREEN STREET Res. Phone, West 9451 Office Phone, Sutter 3580

P. MONTAGUE CO.

TEAMING AND GRADING

Office: General Contractors' Assn. 110 Jessie Street, San Francisco

THERE is something Cheery about a White Cement House that appeals to the owner. Possibly that is why Stucco Homes have predominated in California in recent years.

DEL MONTE WHITE SAND

and

FAN SHELL BEACH SAND

used with a White Cement make a perfect stucco finish.

Pacific Improvement Company

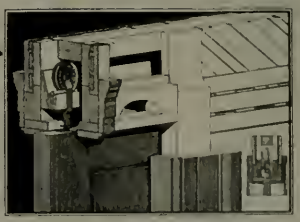
406 Crocker Building

Phone Sutter 6130 San Francisco

See this Pitcher Hanger?

Architect J. R. MILLER used them in the Strathmore Apartments, Eddy and Fillmore Streets, San Francisco.

Ask Him WHY?



MANUFACTURED BY

NATIONAL MILL & LUMBER COMPANY

320 Market Street,
SAN FRANCISCO

Phone Kearny 3580

MOTT PLUMBING FIXTURES

Architects and their clients are invited to visit our Showrooms, 135 Kearny St., San Francisco; D. H. GULICK, Sales Agent. Los Angeles Office, 1001 Central Building; J. R. MAYHEW, Sales Agent. Portland, Ore., Office, Sherlock Bldg.; F. J. KANE, Sales Agent. Seattle, Wash., Office, Securities Bldg.; P. C. WAACK, Sales Agent.

THE J. L. MOTT IRON WORKS

Established 1828

CALIFORNIA STEAM AND PLUMBING SUPPLY CO.

PIPE, VALVES AND FITTINGS FOR STEAM, GAS, WATER AND OIL

COMPLETE STOCK OF The Kelly & Jones Company Products

WRITE FOR CATALOGUE

OFFICE AND WAREHOUSE:
671-679 FIFTH STREET
Corner Bluxome
SAN FRANCISCO, CALIFORNIA

Telephone Sutter 737

ROYAL FLUSH VALVES

are suited to all classes of buildings and all kinds of bowls or urinals. Require no regulating, adapted to any pressure above five pounds and supplied from street main, roof-tank or pneumatic tank. They excel absolutely.

SLOAN VALVE COMPANY

Chicago, Ill. and 624 Wells Fargo Building, San Francisco

Pacific Coast Distributors:

R. W. KINNEY CO., San Francisco	MILLER-ENWRIGHT CO., Sacramento	HUGHES CO., Spokane
N. O. NELSON MFG. CO., Los Angeles	BOWLES CO., Seattle M. L. KLINE, Portland	WALSH & GARDNER Tacoma

SPECIFY GLAUBER FAUCETS

not only because they are GUARANTEED FIVE YEARS, but because of the QUALITY which enables us to guarantee them.

The Jury of Awards at the P. P. I. E. gave us **Seven Medals**, not because we indemnify our users against trouble with our goods, but because **Glauber Quality Faucets** don't cause trouble.

Three hundred of the best buildings on the Pacific Coast are equipped with **Glauber Cocks.**

Send for illustrated specification book.

Main Office and Factory CLEVELAND, O.

Glauber Brass Mfg. Co.
567 Mission Street, San Francisco, Cal.

Eastern Branch 130 W. 32nd St. NEW YORK

CALIFORNIA VITRIFIED BRICK

stands alone in its class among our Home Industries and is the best Paving Block made anywhere.

It is used on the streets of SAN FRANCISCO, OAKLAND, SAN JOSE, BERKELEY, SAUSALITO, LIVERMORE, SARATOGA, CALISTOGA and other California Cities.

Its use Insures Satisfactory and Permanent Pavements

INVESTIGATE NOW SAMPLES FURNISHED

California Brick Company

NILES, CALIFORNIA

Representatives at San Francisco and Oakland Exchanges

LIVERMORE PRESSED, MATT GLAZED AND ENAMELED BRICK

in a variety of colors including "Mottles," "Ruff," White, Ivory White, Cream, Grey, Green, Brown, Blue, etc., are designed to meet the requirements of Architects desiring permanent and unique effects.

Full size sample sent on request.

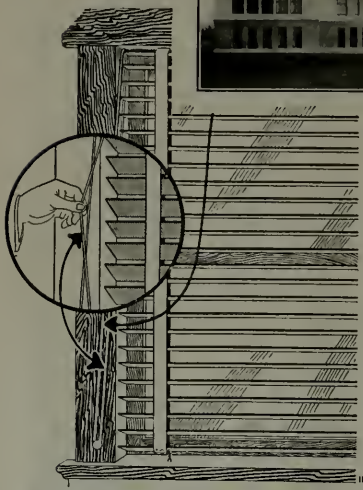
LARGE PRODUCTION—ATTRACTIVE PRICES—PROMPT DELIVERIES

Livermore Fire Brick Works

LIVERMORE, CALIFORNIA

Representatives at San Francisco and Oakland Exchanges

The Slats can be adjusted to Any Angle, supplying Light of the Exact Intensity Required.



GRAMMAR SCHOOL, Walla Walla, Washington. Equipped with WESTERN VENETIAN BLINDS.

Perfect light and ventilation assured with

Western Venetian Blinds

All direct sunlight and glare eliminated. Made to fit all types and sizes of school windows. Easy to operate and will last as long as the building.

WESTERN BLIND & SCREEN CO.

2700 Long Beach Ave., LOS ANGELES

C. F. WEBER & CO.

AGENTS

San Francisco, Reno, Nev. — Los Angeles, Phoenix, Ariz.

Another Victory for Buttonlath!

JEVNE'S GREAT NEW FACTORY BUILDING

SEVENTH STREET AND CENTRAL AVENUE LOS ANGELES

BUTTONLATH has been specified for use throughout the entire building.

BUTTONLATH —is the modern lathing material for interior and exterior. Makes a rigid, fire-retardent, heat-insulating and sound-deadening partition. Prevents plaster cracks and lath stains. Has a positive mechanical key. Saves in cost of labor, amount of plaster required, time of construction, repairs and insurance.

BUTTONLATH MANUFACTURING CO.

Corner of Boyle and Vernon Avenues, LOS ANGELES, CAL. — 77 O'Farrell Street, SAN FRANCISCO, CAL.

VITROLITE
"BETTER THAN MARBLE"

installed throughout in wash basin cubbies, employees' kitchen, shelving, etc.

VITROLITE is a modern sanitary triumph. It is pure white in color, with a high light reflecting factor; can be made sterile with soap and water; is non-porous; will not discolor; is impervious to the action of organic acids; is made in large slabs, and has a smooth surface with a beautiful lustre that will not deteriorate.

VITROLITE is invariably selected wherever beauty—combined with the desire for easily preserved sanitation—is requisite.

Let us send you catalogue and samples.

Vitrolite Construction Company

Standard Oil Building, San Francisco. Benj. G. McDougall, Architect.

1490-92 Mission St., SAN FRANCISCO
Tel. Market 169

Schaw-Batcher Co. Pipe Works

RIVETED STEEL PIPE
PRESSURE TANKS
STORAGE TANKS
WELL CASING

ALL KINDS HEAVY STEEL PLATE WORK

356 Market St., San Francisco Works, South San Francisco

QUALITY PAINT PRODUCTS
Brininstool
San-a-Cote (GLOSS)
(CAN BE SCRUBBED)
AN INTERIOR WALL FINISH
For bath rooms, kitchens, hospitals, schools, office and public buildings. Ask dealers, owners, architects and contractors about this durable, sanitary, washable, economical wall covering.
Brininstool makes a paint for every purpose, and every can purposely good
THE BRININSTOOL CO., LOS ANGELES
COLOR GRINDERS AND PAINT MANUFACTURERS
Distributors—The Brininstool Co., care of Haslett Warehouse Co., 310 California St., San Francisco; Schutz Paint Co., Fresno, Cal.; Schneider, Chappell & Jones, Sacramento, Cal.; Salt Lake Glass & Paint Co., Salt Lake City, Utah; Griffin Paint Co., Ogden, Utah; Ernest Miller Wall Paper Co., 172 First St., Portland, Ore.; Hickox-Crampton Paint Co., Tacoma, Wash.; Campbell Hardware Co., First and Madison Sts., Seattle, Wash.; Imperial Valley Hardware Co., El Centro, Calexico, Imperial, Brawley Seeley; Spokane Hardware Co., Spokane, Wash.; Ellis Paint Co., Butte, Mont.; Simons Paint and Paper Co., Missoula, Cal.

Satisfaction

given a tenant or buyer means good will and good business in the future. Wherever our Oscillating Portal Wall Beds have been installed you will find they are giving absolute satisfaction to the tenants. The added use of the rooms and the saving in housework they offer, have won for them the favor of the housewives. They are recognized as a proven utility and as a point in favor of the house where they are installed.

MARSHALL & STEARNS CO.
WALL BEDS
1152 PHELAN BUILDING SAN FRANCISCO
1774 BROADWAY OAKLAND

Clinton Welded Wire Fabric
CLINTON WIRE LATH
L. A. NORRIS COMPANY
Phone Kearny 5375 140 Townsend Street, San Francisco

United States Mint, San Francisco

All stone work on this building has been treated with

IMPERIAL WATER PROOFING

to prevent absorption and disintegration. The process leaves the stone in its natural color.

WE SPECIALIZE
IN

WATER PROOFING PROBLEMS

Above Ground — Under Ground

IMPERIAL COMPANY
Builders Exchange Building
183 Stevenson St. San Francisco

Johns-Manville Asbestos Roofing

For Permanent Protection Against Weather and Fire

Emphasize Permanence in your roofing specifications; more particularly secure incorporation of this quality in the roofing itself—and you have performed a distinct service to your client. You have saved him the cumulative expense of years of upkeep.

Hundreds of examples testify to the durability of Johns-Manville Asbestos Roofing—years of satisfactory service with little if any painting and with almost no signs of wear. This roofing may be considered permanent because it is all-mineral—a practically imperishable combination of asbestos and asphalt. Resists fire, water, storm, heat or cold.

H.W. JOHNS-MANVILLE CO.
OF CALIFORNIA
2od & Howard Sts., SAN FRANCISCO
—Los Angeles Sacramento San Diego

Stationary Outfit

To ARCHITECTS and ENGINEERS

The Public is tired of buying Gasoline by hidden measurement—All up-to-date equipments demand the VISIBLE Method of Supply.

DELANOY VISIBLE SYSTEM

Any station equipped with the visible apparatus will sell from 25 to 50 per cent more gasoline than by the ordinary method. Send for Circulars.

RIX COMPRESSED AIR & DRILL CO.
Sole Manufacturers
San Francisco Los Angeles

"THE BOUDOIR" (Reg. Trade Mark)
Pat. Dec. 1913, Jan. 1915

Examine any bathroom, or any plan of a bathroom, with three separate fixtures set in any of the customary ways.

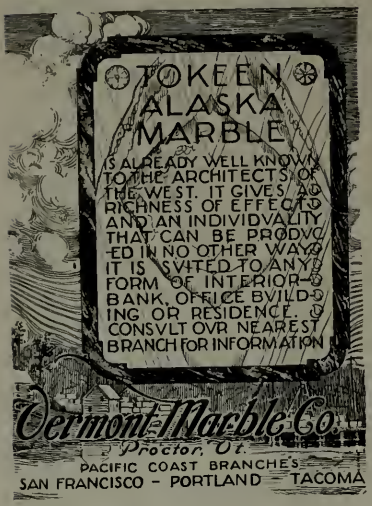
Cut out the separate lavatory, all its fittings, supply and waste pipes, trap, vent and connections. Sum up the cost of these, then

Substitute "THE BOUDOIR" Bath Fixture, with its large 20x24-inch pedestal lavatory, accessibly placed, taking no space usable for any other purpose.

Notice the improved appearance, additional room, the gained conveniences of a sitting shower, shampoo, washing in fresh running water, support in getting in and out of the bath tub, fewer fittings to polish and keep in order

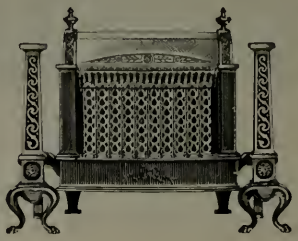
Prompt deliveries anywhere from our nearest Factory.

IMPROVED SANITARY FIXTURE COMPANY, 632 Metropolitan Bldg., Los Angeles, California. - U. S. A.


TOKEEN
ALASKA
MARBLE
IS ALREADY WELL KNOWN TO THE ARCHITECTS OF THE WEST. IT GIVES AN RICHNESS OF EFFECT AND AN INDIVIDUALITY THAT CAN BE PRODUCED IN NO OTHER WAY. IT IS SUITED TO ANY FORM OF INTERIOR—BANK, OFFICE BUILDING OR RESIDENCE. CONSULT OUR NEAREST BRANCH FOR INFORMATION
Vermont Marble Co.
Proctor, Vt.
PACIFIC COAST BRANCHES
SAN FRANCISCO – PORTLAND – TACOMA

THE HUMPHREY Radiantfire

A TRIUMPH IN GAS HEATING



Designed for installation in open fireplaces. No unburned gases, odorless, and does not vitiate the air of the room.

Fascinating effect and high heat efficiency.

GENERAL GAS LIGHT COMPANY

C. B. BABCOCK, Manager

768 Mission Street San Francisco

A BEAUTIFUL HOME—

IMPOSING ENTRANCE POSTS, Fence and Garden Ornaments, made of Cement, add an Indisputable Touch of Beauty and Feeling of Comfort to the Real Country House. The Fence, Posts, and Fruit Baskets shown in this picture were made by

G. Rognier & Co.

Garden Furniture, Flower Pots, Vases Sun Dials, etc.

Designs Submitted

233 Railroad Ave., SAN MATEO, CAL.

VACATION

SPEND IT IN THE BEAUTIFUL

FEATHER RIVER COUNTRY

IN THE

HEART OF THE HIGH SIERRAS

REACHED ONLY VIA

WESTERN PACIFIC

NUMEROUS RESORTS ALONG THE

FAMOUS FEATHER RIVER

AND NEAR THE LAKES AND STREAMS

WHERE

The Fish and Game Abound

All Forms of Outdoor Sports

LOW FARES TO ALL POINTS

Folders Free on Request

Ticket Offices

665 Market Street and Ferry Building, San Francisco. Phone Sutter 1651

1326 Broadway, Oakland. Phone Oak. 600

Beautiful Oak Floors

Are the source of unlimited satisfaction and pride. Wherever OAK FLOORING is used it always attracts a better class of tenants, and assures better renting and selling values.

OAK FLOORS mean satisfaction. The first cost is the last, as all repairs are eliminated. With a little care OAK FLOORS will last a life time.

$\frac{3}{8}$ inch thickness OAK FLOORING is the ideal flooring for covering used pine floors in old houses when remodeling, or in new houses over cheap sub-floors. When laid it has all the appearance of 13/16 inch thickness.

When you specify OAK FLOORING be sure and mention "MADE FROM AMERICAN GROWTH OAK," as there is on the market at this time on the Pacific Coast a substitute called "Japanese Oak Flooring" that is inferior in texture and quality. Have your superintendents follow this up and see that every bundle is plainly marked with a rubber stamp "MADE FROM AMERICAN GROWTH OAK."

Specify AMERICAN OAK FLOORING and Satisfy your Clients.

See our page, No. 758, 1916 Sweet's Catalogue, or write us for further information.

Oak Flooring Service Bureau

1603 UNION TRUST BUILDING CINCINNATI, OHIO

RUBBER GOODS

for

ALL KINDS OF BUILDINGS

including

MATS MATTING TILING

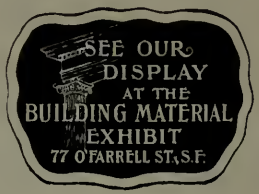
Cotton, Linen and Rubber HOSE

FIRE EXTINGUISHERS

GOODYEAR RUBBER CO.

587-589-591 Market St. San Francisco, Cal.

ARCHITECTS visiting San Francisco this summer are cordially invited to make their headquarters at the BUILDING MATERIAL EXHIBIT, 77 O'Farrell street. Plenty of stationery at your disposal, also telephone. And a cool, comfortable place to rest.



HOTEL ST. FRANCIS

SAN FRANCISCO

Most Beautifully Decorated Public Rooms in the World
European Plan from $2.00

Management :: :: :: JAMES WOODS

STEEL BARS FOR CONCRETE REINFORCEMENT

TWISTED SQUARES, PLAIN SQUARES AND ROUNDS

We Will Make Lump Sum Bids on Reinforcement Fabricated and Installed.

PIG IRON, COKE AND FERRO ALLOYS

WOODS, HUDDART & GUNN

444 MARKET STREET Tel. Sutter 2720 SAN FRANCISCO, CAL.

STEEL OPEN HEARTH BARS FOR CONCRETE REINFORCEMENT

Square Corrugated and Cold Twisted, Plain Rounds and Squares

-----MERCHANT STEEL-----

Flats, Angles, Channels, Rounds, Squares, Rivet & Bolt Steel, Structural Shapes

PACIFIC COAST STEEL COMPANY

PHONE SUTTER 1564

General Office, Rialto Bldg., San Francisco
Sales Office, " " " "
Sales Office, Union Oil Building, Los Angeles
Sales Office, Seattle, Wash.

ROLLING MILLS:
South San Francisco
Seattle, Wash. Portland, Ore.

· Pack your Radiator Valves with

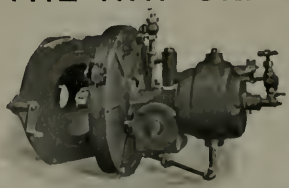
Palmetto Twist Packing

It can be unstranded to fit any size valve. It does not get hard.

H. N. COOK BELTING CO.

317-319 Howard St. San Francisco, Cal.

THE RAY OIL BURNING SYSTEM—1917 MODEL



Improvements: Enclosed motors, dust, oil and water proof; oil-cooled motor runs 75 per cent cooler; oil heated electrically. Only one place to lubricate for entire machine, and many more exclusive features. Send for catalogue.

Salesroom, 218-220 Market St., SAN FRANCISCO
Phone Kearny 199

Works, Bosworth, Milton & Rousseau, S. P. R. R., San Francisco. Phone Mission 8022

SOMETHING NEW!

Auxiliary Units to HOOSIER Cabinet

Cupboard, Cooler, Chest and Drawer Units furnished in sections so one or all can be added to Regular Cabinet, thus making the HOOSIER a full Kitchen Equipment.

Insures Economy of Space, Harmony and Uniformity in appearance. Takes the place of old fashioned and Unsanitary Built-in Cupboards.

Architects and Builders will be furnished free full details, measurements and blue prints of this ideal method of equipping kitchens.

THE HOOSIER MFG. CO.

NEW CASTLE, IND.

BRANCH

1067 Market Street, SAN FRANCISCO Telephone Market 8854

SANTA FE
BUILDING
San Francisco

WOOD & SIMPSON,
Architects

Richmond
Red Sand-
Faced Brick

MANUFACTURED BY

RICHMOND PRESSED BRICK WORKS

RICHMOND, CALIFORNIA

SOLD THROUGH

UNITED MATERIALS COMPANY

Distributors for Northern California

CROSSLEY BUILDING, SAN FRANCISCO

The GOLD MEDAL MAIL CHUTE

INSTALLED IN THE NEW SAN FRANCISCO CITY HALL AND THE WHITE MARBLE MERRITT BUILDING, LOS ANGELES

Given highest award at Panama-Pacific International Exposition, 1915.

Represented on the Pacific Coast by

United States Metal Products Co.
525 Market Street
SAN FRANCISCO
Agents for California and Oregon
F. T. CROWE & CO.
Seattle
Agents for Washington.
American Mailing Device Corporation

The Cutler Mail Chute

Mail Box—L. C. Smith Building Seattle, Wash., Gaggin & Gaggin, Architects, Syracuse, N. Y.

Pacific Coast Representatives:

San Francisco, Cal., THOMAS DAY COMPANY.

Portland, Ore. C. W. BOOST.

Seattle and Tacoma, Wash., D. E. FRYER & CO.

Spokane, Wash. E. C. TOUSLEY.

Cutler Mail Chute Co.,
ROCHESTER, N. Y.
Cutler Building.

BIGLEY'S

Curtains
Decorated Lamps
and Pottery
Fine Upholstered
and Period
Furniture

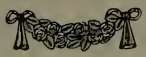
498 GEARY STREET
San Francisco, Cal.
Telephone: Franklin 5919

THE·L· SCHREIBER & SONS Co

ORNAMENTAL IRON & BRONZE
STRVCTVRAL STEEL
CINCINNATI

SAN FRANCISCO
WESTERN BVILDERS SVPPLY CO
155 NEW MONTGOMERY ST.
LOS ANGELES
SWEETSER & BALDWIN SAFE CO
200 EAST 9TH ST

Antiquities, Artistic Ornaments for the Interior



A little expenditure adds to your Home Decorations the Grace of Genuineness and Rare Artistry.

A. FALVY

578-580 SUTTER STREET

Tel. Sutter 6939 SAN FRANCISCO

H. E. BOTHIN, PRESIDENT
W. H. FRENCH, VICE-PRES AND GEN MANAGER
R. B GIRDWOOD, SECRETARY

JUDSON MANUFACTURING CO.

MANUFACTURERS OF
OPEN HEARTH STEEL
INGOTS, BARS, PLATES AND SMALL SHAPES

STRUCTURAL AND BRIDGE WORK
FOUNDRY, MACHINE AND PATTERN WORK
SHAFTING, BOLTS, SPIKES ETC

MAIN OFFICE AND SALESROOM
819-823 FOLSOM STREET
TELEPHONE SUTTER 4626

OPEN HEARTH STEEL BARS

STRUCTURAL STEEL

Machine Work—Bolts—Castings
Pattern and Blacksmith Work

SIDEWALK LIGHTS

SIMPLEX SYSTEM

Pre-cast reinforced concrete slabs for frames. Combines all the advantages of cast iron and the ordinary concrete type.

PACIFIC BUILDING MATERIALS CO.

523 Market St. TELEPHONE KEARNY 3393 S. F.

FORUM BUILDING, SACRAMENTO, CAL.
R. A. Herold, Architect

The above is a Progress Picture of the Four Story addition to Sacramento's Largest Office Building, Now Completed.

STRUCTURAL STEEL FABRICATED AND ERECTED BY

The Palm Iron and Bridge Works

(Incorporated)

15th and R. Sts., Sacramento, Cal.

CALIFORNIA ARTISTIC METAL & WIRE CO.
J. T. McCORMICK, PRESIDENT
ORNAMENTAL IRON AND BRONZE
349-365 SEVENTH ST. SAN FRANCISCO

MORTENSON CONSTRUCTION CO.
CONTRACTORS FOR STRUCTURAL STEEL AND IRON
H. MORTENSON, Pres. CHAS. G. MORTENSON, Vice-Pres. and Mgr.
OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS
PHONE: MISSION 5033 SAN FRANCISCO, CAL

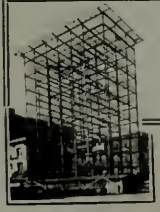
WEST COAST WIRE AND IRON WORKS
MANUFACTURERS OF
ARTISTIC BRONZE, IRON AND WIRE WORK
OF EVERY DESCRIPTION AND FINISH
861-863 HOWARD STREET SAN FRANCISCO, CAL.

FAIR MANUFACTURING COMPANY
J. FEY KERT, Proprietor
ORNAMENTAL AND MISCELLANEOUS IRON WORK
617 BRYANT STREET, SAN FRANCISCO Douglas 5122

THE GOLDEN GATE IRON WORKS
STRUCTURAL STEEL
1541-1549 HOWARD STREET, BETWEEN 11th AND 12th STREETS
Tel. Market 5445 San Francisco

Telephones Mission 139—Mission 59 A. A. Devoto, President
CENTRAL IRON WORKS, Inc.
STRUCTURAL STEEL
Office and Works: 621-651 Florida Street
Bet. Harrison and Bryant, 18th and 19th SAN FRANCISCO, CAL.

TWISTED and DEFORMED STEEL BARS *FOR REINFORCED CONCRETE CONSTRUCTION.*
Southern California Iron & Steel Co.
FOURTH AND MATEO STREETS
LOS ANGELES, CAL.
W. B. KYLE, New Call Building,
San Francisco Representative.



SCHRADER IRON WORKS, Inc.
STRUCTURAL STEEL CONTRACTORS
Fire Escapes, Waterproof Trap Doors, Ornamental Iron Work
1247-1249 HARRISON STREET
Bet. 8th and 9th
SAN FRANCISCO, CAL.
Telephone Market 337

P. Noble, Pres.
E. B. Noble, Vice-Pres.
A. E. Wilkins, Sec'y

Beam, Angle, Channels, and Universal Mill Plates for immediate shipment from stock

Pacific Rolling Mill Co.

SUPPLIERS OF

FABRICATED STRUCTURAL STEEL, Forgings, Bolts, Rivets, Frogs, Switches, Cast Iron Castings

General Office and Works
17th and MISSISSIPPI STS., SAN FRANCISCO
Telephone Market 215

W. B. MORRIS, President H. M. WRIGHT, Vice-President L. J. GATES, Secretary

WESTERN IRON WORKS

STRUCTURAL IRON and STEEL CONTRACTORS

Gas Holders, Vault Linings, Jails, Fire Escapes, Beams, Channels, Angles and Steel Wheelbarrows Carried in Stock

Phones: Kearny 575
J 1259

141-147 BEALE STREET
132-148 MAIN STREET
SAN FRANCISCO, CAL.

TELEPHONE, MISSION 1763

C. J. HILLARD CO., Inc.

MANUFACTURERS OF

Bank and Office Railings. Elevator Enclosures and Cars.
Cast Iron Stairs and Store Fronts. Wire Work. Fire Escapes.

Nineteenth and Minnesota Sts.
Next to California Canneries

San Francisco, Cal.

Structural Steel
Ornamental Iron
Ornamental Bronze
Prison Work
Vault Work
Metal Furniture
Filing Devices
Library Shelving
Stock Room Shelving
Steel Lockers
Electroliers

RALSTON IRON WORKS

INCORPORATED
TWENTIETH AND INDIANA STREETS
SAN FRANCISCO, CALIFORNIA
PHONE MISSION 5230

When writing to Advertisers please mention this magazine

CRANE
FITTINGS

MALLEABLE CAST IRON
ARE THE STANDARD

because they do the work that they are made to do with a liberal factor of safety. Accurately made, chamfered threads, and properly proportioned they are the choice of all good architects.

We carry in stock at all times the largest line of sizes and shapes so that we may meet promptly whatever calls are made for these goods. Our Catalogue No. 40 (which will be sent on request) further illustrates and describes the extensive line of CRANE FITTINGS.

CRANE CO.
PLUMBING SUPPLIES
Steam and Hot Water Heating

2ND & BRANNAN
STREETS
SAN FRANCISCO

Architects designing hotels, apartment houses, theatres and office buildings, should keep in mind the fact that THREE BARRELS OF FUEL OIL burned by the

Fess System

will equal the heat produced by a TON OF COAL — *Economy for the Owner.*

And that the FESS SYSTEM is the Only Fire-Proof Rotary Burner manufactured — *More Economy for the Owner — Less Insurance to pay.*

Fess System Rotary Crude Oil Burners
FOR HEATING, POWER, COOKING
Office and Factory — 218 Natoma St., San Francisco
Branches — 1310 So. Hill St., Los Angeles; 428 Alder St., Portland, Ore.; 132 B St., San Diego.

Hipolito

EVEN TENSION
Window Screens Screen Doors

ROLLER SCREENS
For Casement Windows

METAL FRAME SCREENS

SEE DISPLAY AT
Building Material Exhibit
77 O'Farrell St. San Francisco

Simpson & Stewart
FACTORY DISTRIBUTORS
565 16th St., Oakland, Cal.
TELEPHONE LAKESIDE 415

Better than Window Shades
BURLINGTON VENETIAN BLINDS
can be adjusted to *let in* light and air, yet *keep out* the sun and the gaze of outsiders. They make your sunny rooms cool and restful; your porch a shady, airy and secluded haven of comfort.

Also order Burlington Window Screens (inside or outside) and Screen Doors with Rust-proof wire cloth, they have the quality. Instead of old-fashioned *folding* blinds insist on BURLINGTON Patent Inside *Sliding* Blinds. Look for the name "Burlington": best for cottage or mansion.

Burlington Venetian Blind Co.
BURLINGTON, VT. 365 MARKET ST. SAN FRANCISCO

Illinois Automatic Vacuum and Vapor Systems of Heating

Improved with graduated control. You can have much heat or little as conditions demand. Our Thermo Trap prevents any waste of heat and consequently saves fuel. Used in the biggest buildings and factories all over the United States and Canada.

We also manufacture a full line of Hughson, John Davis, Eclipse Pressure Reducing Valves and Back Pressure Valves, Oil Separators, etc.

"Twenty-five years of quality."

We carry a full line in San Francisco.

ILLINOIS ENGINEERING COMPANY

JAS. I. KRUEGER, *Representative*

559-561 Pacific Building, San Francisco

Telephone: Kearny 3047

The DUNHAM VAPOR HEATING SYSTEM

Represents the highest development in heating.

The DUNHAM VAPOR HEATING SYSTEM represents the highest quality to be found in any vapor system on the market. It sells for the most money because the devices furnished with the DUNHAM SYSTEM are complete and perform a real service in vapor heating, not found in imitating systems.

The DUNHAM VAPOR HEATING SYSTEM is both a heating system and a temperature regulating system. It appeals to the owner seeking a heating system which will add refinement to his home.

C. A. DUNHAM COMPANY

WELLS FARGO BUILDING SAN FRANCISCO, CAL.

JOHN A. HOOPER, Pres. FRANK P. HOOPER, Vice-Pres. A. W. HOOPER, Sec'y

Hooper Lumber Company

Wholesale and Retail Dealers in

OREGON PINE AND REDWOOD

17th and Illinois Sts., San Francisco

Car shipments to all Central California Points
Schooner shipments to Bay and River landings

Contractors' House Bills solicited
Phone Market 5313

OIL BURNERS
VACUUM PLANTS
ICE MACHINES

The Three Essentials for the Up-to-date HOTEL and APARTMENT HOUSE.

With a JARVIS Guarantee Your Troubles Are Over.

Home Manufacture—Everything but the motors

T. P. JARVIS CRUDE OIL BURNING COMPANY

Phone Market 3397 275 Connecticut Street, SAN FRANCISCO

NILES SAND GRAVEL & ROCK CO.

GRAVEL BEDS AND PLANT, NILES, CALIFORNIA

MAIN OFFICE
MUTUAL BANK BUILDING
704 MARKET ST.
SAN FRANCISCO

TELEPHONE DOUGLAS 182

Crushed and screened concrete Gravel and Rock. Sharp, clean Concrete Sand, or Topping. All from fresh water, thoroughly washed, and in any size or mixture, with or without sand, as desired.

Free from Salt.

A. F. EDWARDS, President
J. M. FABBRIS, Vice-President
J. A. MACKENZIE, Secretary
CHAS. F. EISELE, J. RUBIOLO, Asst. Managers

AMERICAN MARBLE & MOSAIC CO.

25-29 Columbia Square, San Francisco
Telephone Market 5070

Factory on Canal, South San Francisco Telephone South San Francisco 161

THE BITURINE COMPANY

Specializing in Protective Coatings for Iron and Steel

STRUCTURAL STEEL PAINT
INTERIOR TANK ENAMEL

Telephone Kearny 4478

24 CALIFORNIA STREET
SAN FRANCISCO

THE KINNEAR MFG. CO.
COLUMBUS, OHIO

STEEL ROLLING FIREPROOF DOORS AND SHUTTERS

Agents
Seattle - Portland - Los Angeles - Salt Lake City

San Francisco Office 517 Rialto Building

NA720.5
Ar24
129181

THE ARCHITECT & ENGINEER

VOL. L. OF CALIFORNIA No. 1.

CONTENTS FOR JULY, 1917

	Page
Cover Design by Wm. O. Raiguel	
Frontispiece—Wheeler Hall and Library, University of California John Galen Howard, Architect	38
Recent Work at the University of California Irving F. Morrow, Architect The plates illustrating this article were taken especially for this magazine and are the first to be shown since completion of the buildings.	39
The Housing of a Fire Department Clarence R. Ward, Architect	51
City Planning Progress in California Charles Henry Cheney	63
Standard Slow Combustion Building Alfred Kuhn, Architect	71
New Branch Libraries in Los Angeles	79
Standardized Steel Frame Construction	84
Scope of an Architect's Authority A. L. H. Street	87
Oak and Its Uses W. L. Claffey	90
Criticism of the New Architects' License Law in Idaho	91
Unique Glass Front Building for San Francisco	96
After the Architect C. B. J. Snyder	98

Published Monthly at 626-627 Foxcroft Building, San Francisco in the interest of
ARCHITECTS, STRUCTURAL ENGINEERS, CONTRACTORS AND THE ALLIED TRADES OF THE PACIFIC COAST

Yearly Subscription $1.50
Single Copy 25 cents

Entered at San Francisco Post Office as Second Class Matter

Copyright 1917 by A. I. Whitney. All Rights Reserved

WHEELER HALL AND LIBRARY FROM SATHER GATE,
UNIVERSITY OF CALIFORNIA
JOHN GALEN HOWARD, ARCHITECT

Frontispiece
The Architect and Engineer
of California
for July, 1917.

THE
ARCHITECT
AND
ENGINEER
OF CALIFORNIA

Volume L. JULY · 1917 Number 1.

Recent Work at the University of California

By IRVING F. MORROW, Architect.

WHEELER HALL

SO gradual, so unostentatious, in the main so harmonious withal, has been the architectural development on the Campus of the University of California at Berkeley, that only a conscious glance over the work accomplished serves to enforce an appreciation of the extent of the activity and its significance as an achievement, its potentiality in the formation among us of something deserving to be designated public taste. A fortuitous gathering of buildings has reached a degree of consolidation in which the discerning can sense a plan. In length alone the list of new structures is becoming impressive. The new architectural era at the University was inaugurated some fourteen years back with the Hearst Memorial Mining Building. At varying intervals subsequently have followed California Hall, the Greek Theatre, the Doe Memorial Library (first unit), Boalt Hall of Law, the Sather Gate, Agriculture Hall, and the Jane K. Sather Tower. All of these are prior to the subjects of present consideration, the Library addition (or completion) and Benjamin Ide Wheeler Hall. To complete the inventory one must subjoin two buildings still in course of construction, the Chemistry Build-

*Photos by Sidney Webb, Berkeley, California.

ing and Hilgard Hall. One is grateful to note as well the initial steps in a comprehensive parking of the grounds.

These elements, already, as we have seen, considerable in number, are united by palpable evidences of a common authorship into a congenial body of work, albeit severally they vary in character from the utilitarian in the new Chemistry Building to the monumental in the Campanile, and in quality from Boalt Hall, of which the anomalies are the more insidious for being disguised in the garb of strict architectural decorum, to California Hall, still unsurpassed in the work of the University—one is inclined to add, in that of Mr. Howard—for unity, breadth, and detailed perfection—that precious apparition, a building with a spirit.

Not since California Hall has the University made an acquisition calling for such special attention as the two buildings most recently completed.

In its broad aspects the completion of the Library was implicit in the original structure, albeit we witness an unexpected departure, not only from what seemed indicated in this building, but equally from the precedent of all previous University work, in the Italian sumptuousness of the new reading room. The approaches are inadequately contrived to a degree which seems explicable only upon the assumption of departmental interference and dictation. Once within, those who are unfamiliar with the inspiration of great architectural achievements must experience a sense of revelation; to the initiated it cannot but prove a consolation.

On Benjamin Ide Wheeler Hall Mr. Howard has plainly bestowed his best efforts. An evident striving toward a high degree of perfection, it is true, has not served to preclude a deficiency observable to some degree in all previous buildings on the Campus—a lack of sustained development or of continuity of finish, a failure to correlate the utilitarian with the monumental parts of the design, which, by suggesting flagging zeal or failing ingenuity, results in a sense of severe disappointment. Every building presents portions where it is as undesirable as it is impossible to exceed a minimum of expenditure. In such places one exacts simplicity of treatment rather than lack of treatment. In negotiating between the engineer and the public, one refuses to accept the hand of the painter as an adequate substitute for the mind of the architect.

Yet with no uncertain accent of authority Wheeler Hall voices the best message of one of the best periods of French thought—unity, clarity, restraint, poise, centrality of intent pursued with a calculated economy of means. Our community possesses no edifice, the City Hall in San Francisco alone excepted, which delivers a message of comparable importance with equal force and address. Before this building one cannot fail to be conscious of a dominating humanistic preoccupation—I had almost said prejudice, but for the inherent antithesis between prejudice and a truly humane outlook. Enthusiasm is not present here; it may be urged that the critical faculty appears to have been invoked equally with the creative; it is questionable, especially at a moment like the present, whether this is the greater condemnation or commendation; in any case, the end here sought and achieved is one of greater import than any expression of personal charm, and a deficiency in individuality by no means implies an absence of personality. At a time when even our colleges, the traditional repositories of caution and proved attainment, ("conservatism" one dare not utter on pain of being hurled among the damned), seem to be drifting in the flux of individualistic tendencies, it is reassuring to note the attitude of deference in which this building stands before the best experience of the past.

If our impulse to return and linger is to be credited, the west facade of Wheeler Hall is the finest thing on the Campus of the University of California.

DEVELOPMENT AROUND CAMPANILE SHOWING LIBRARY AND WHEELER HALL
John Galen Howard, Architect

LIBRARY, CAMPANILE AND WHEELER HALL
John Galen Howard Architect

WHEELER HALL — SOUTH FRONT
JOHN GALEN HOWARD, ARCHITECT

WHEELER HALL — SOUTH FRONT
JOHN GALEN HOWARD, ARCHITECT

WHEELER HALL — SOUTH FACADE
JOHN GALEN HOWARD, ARCHITECT

WHEELER HALL — NORTH FACADE
JOHN GALEN HOWARD, ARCHITECT

WHEELER HALL—FROM NORTHWEST
John Galen Howard, Architect

WHEELER HALL—WEST FACADE
John Galen Howard, Architect

WHEELER HALL VESTIBULE
John Galen Howard, Architect

LIBRARY ADDITION
John Galen Howard, Architect

LIBRARY—EAST FACADE, SHOWING NEW READING ROOM
JOHN GALEN HOWARD, ARCHITECT

DOE LIBRARY, UNIVERSITY OF CALIFORNIA
John Galen Howard, Architect

More San Francisco Office Buildings

The fact that two large office buildings are about to be erected in San Francisco's commercial center is taken as good evidence that the war is not seriously interfering with local building conditions. If there has been any cessation of building activity, it may be attributed more to the high cost of materials than to any other single or collection of causes. Besides a ten-story addition to the Newhall building at California and Battery streets, spoken of elsewhere in this issue, Mr. Frederick Whitton announces that he has been commissioned to prepare plans and superintend the construction of an eight-story office building on Pine street, between Sansome and Montgomery streets—the site of the historic San Francisco Stock Exchange—for the Exchange Realty Company. It will be constructed of reinforced concrete in lieu of an uncertain structural steel market, and will cost approximately $125,000. There will be twenty-six offices to a floor. The front of the building will be faced with pressed brick and terra cotta. There will be three high-speed electric passenger elevators.

* * *

Four Story Loft Building

Mr. Nathaniel Blaisdell, architect, with offices at 255 California street, San Francisco, has completed plans for a four-story mill construction store and loft building to be erected on Mission street in the rear of the Emporium, San Francisco, for the Boyd Estate. The building will be 47x160 feet and has been leased to the Hulse-Bradford Company for a term of years. It will be equipped with automatic sprinklers, passenger and service elevators, and will cost approximately $75,000. Mr. G. W. P. Jensen will be the builder.

ENGINE HOUSE NO. 12, SAN FRANCISCO FIRE DEPARTMENT
WARD & BLOHME, ARCHITECTS

ENGINE HOUSE NO. 12—DRUMM STREET FRONTAGE
Ward & Blohme, Architects

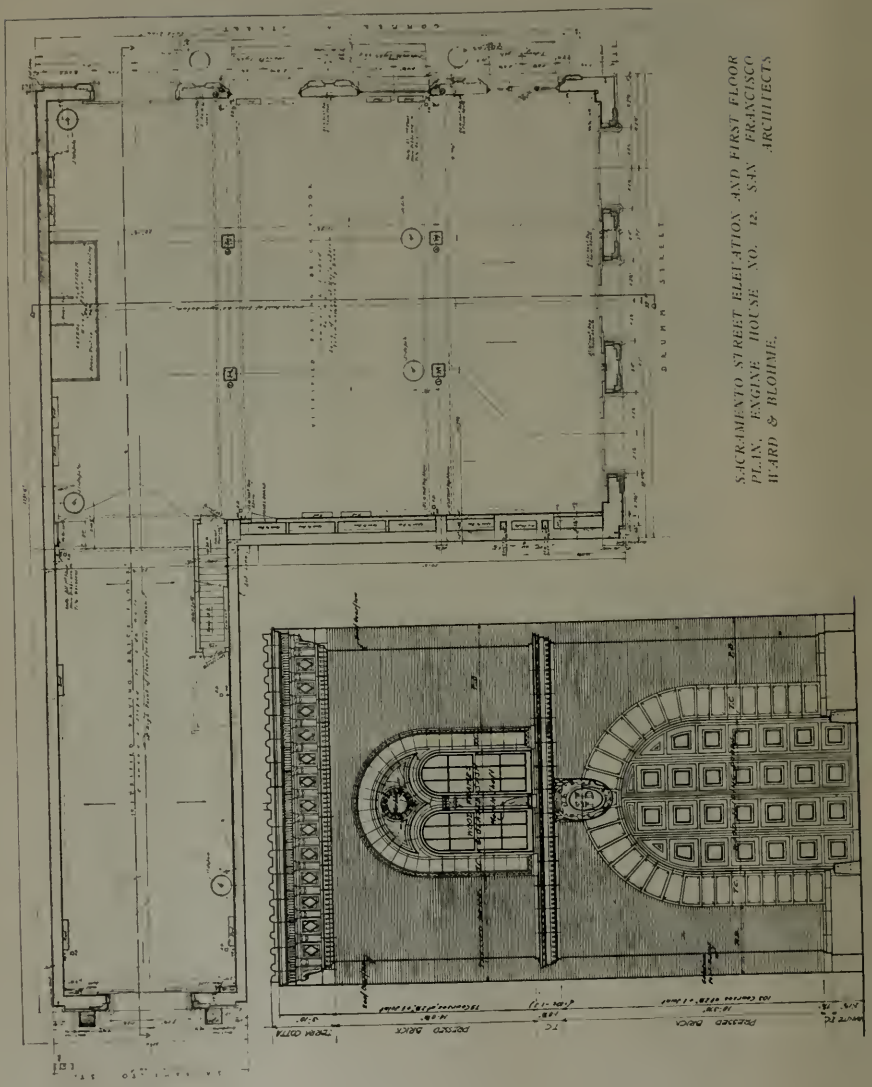
The Housing of a Fire Department

By CLARENCE R. WARD, Architect.

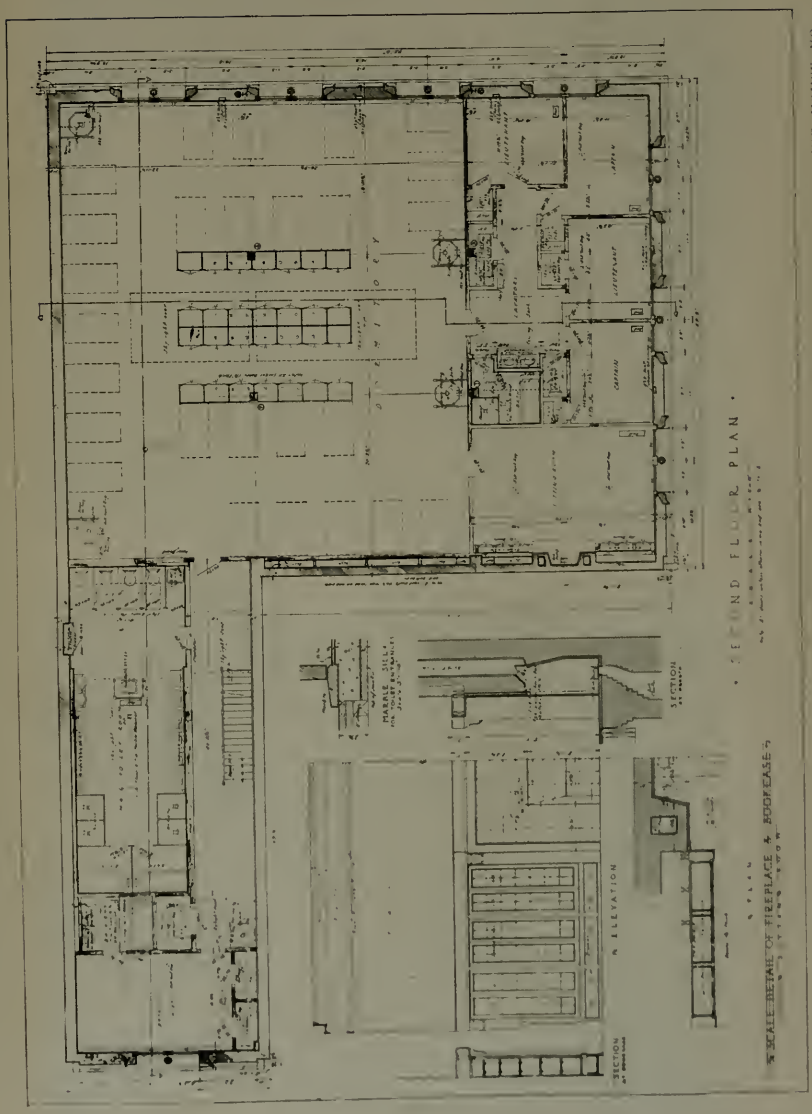
GONE are the days when the brave volunteer fireman "ran with the old machine." Of the past are the red flannel shirt and the speaking trumpet whose chief function appeared to be that of a cornucopia in which to carry flowers on the occasion of the Fourth of July parade. Also of the past, although of more recent memory, are the clang of the gong and the clatter of the horses' hoofs, followed by quick work with the trick harness and the spectacular gallop through the streets. Returning from a fire the damp and cold fireman took a bath in the horse bucket and crept to bed by the aid of a smoky lantern.

Supplanting all of this is the much needed modern fire department with its high powered motor vehicles and apparatus attended by the conveniently and comfortably housed and therefore highly efficient fireman. If the reader does not believe extreme high efficiency in a fire department necessary, he is referred to the appalling statistics of the Board of Fire Underwriters as to fire losses during the past ten years. As it is with the soldier, so it is with the fireman, the more comfortable and cheerful his environment the more keen and capable he is for his dangerous work.

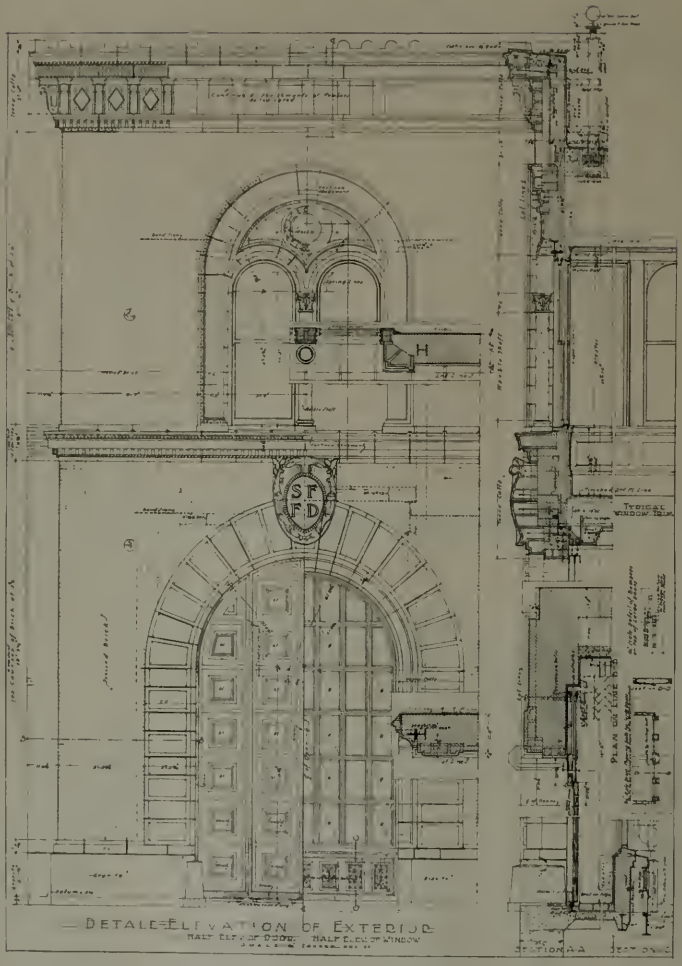
The accompanying illustrations and drawings will serve in part to indicate what is meant by these statements. It has been found that if an effort is made to give the exterior of these houses some semblance of architectural dignity or beauty, the dwellers (the fireman practically lives in the firehouse) become imbued with a certain pride in their particular house, as one might have in his home. This makes for competition, cleanliness, discipline and finally efficiency in the various departmental units. The arrangement of interior reflects the



SACRAMENTO STREET ELEVATION AND FIRST FLOOR PLAN, ENGINE HOUSE NO. 12, SAN FRANCISCO
WARD & BLOHME, ARCHITECTS



SECOND FLOOR PLAN, ENGINE HOUSE NO. 12
HARD & BLOHME, ARCHITECTS



DETAIL ELEVATION OF EXTERIOR, ENGINE HOUSE NO. 12
WARD & BLOHME, ARCHITECTS

APPARATUS ROOM, ENGINE HOUSE NO. 12
Ward & Blohme, Architects

BATTALION CHIEF'S QUARTERS, ENGINE HOUSE NO. 12
Ward & Blohme, Architects

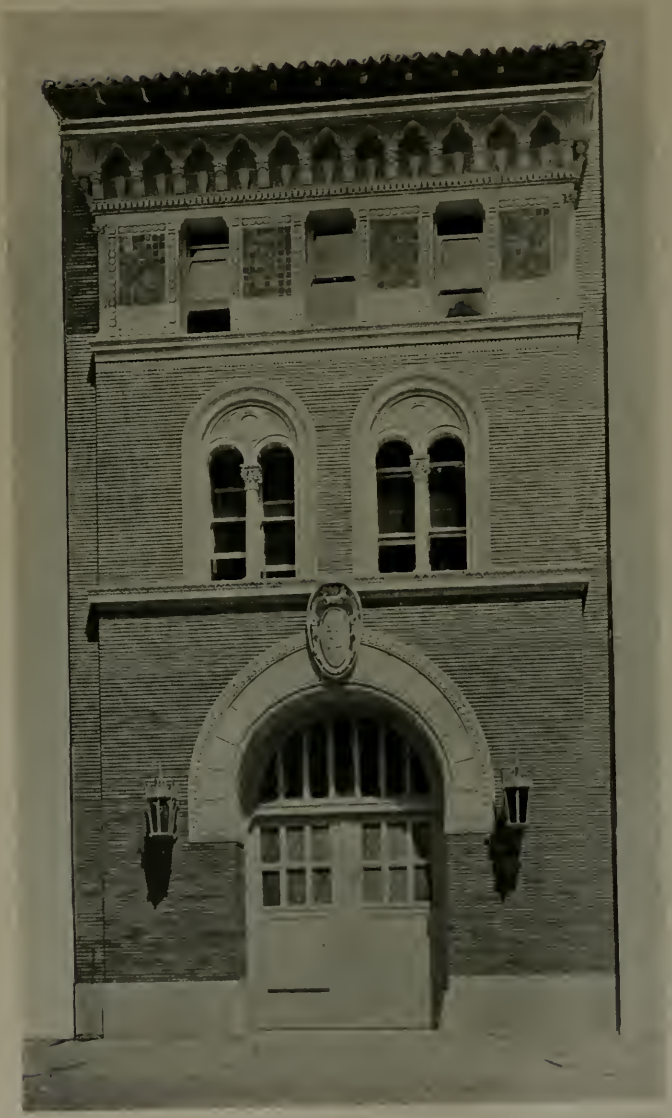
LAVATORY, ENGINE HOUSE NO. 12
Ward & Blohme, Architects

appearance of the exterior. The dormitories are large and well lighted and ventilated.

The plumbing is of the highest type and selected with a view to its durability and consequent economy. Tub and shower baths, which are most essential, are provided in quantity. The heating systems, both for domestic hot water and heat, are made automatic for economic reasons.

The apparatus rooms have white tiled walls; the floors are either of vitrified brick, tile or concrete with special hardener, providing an impervious surface. These rooms are arranged to provide a handsome and cleanly setting for the apparatus and are thus designed to encourage the best of care for the apparatus. Convenient and up-to-date storage plants for gasoline and oil are provided. In addition to the sleeping quarters the houses are arranged with rest rooms and lounging rooms. Ventilated dry rooms and rigs rooms are also provided so that the firemen's clothing may be properly taken care of on return from fire duty, and in addition each house is equipped with a complete kitchen so that the firemen may be given proper refreshment upon returning from duty.

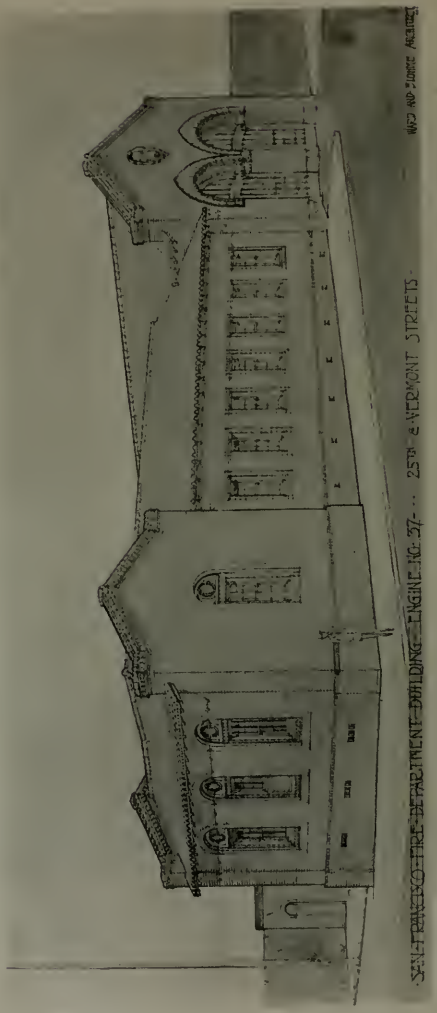
The automatic control of the lighting system is so arranged as to illuminate the entire premises upon the turning in of an alarm and after the company has left the building the lights are automatically extinguished. This makes for a great saving in the cost of electric current. The alarm, telephone and telegraph systems are elaborately planned and constructed and yet most simple in their operation.



ENGINE HOUSE NO. 17, MINT AVENUE, SAN FRANCISCO
WARD & BLOHME, ARCHITECTS

ENGINE HOUSE NO. 3, POST STREET, SAN FRANCISCO
WARD & BLOHME, ARCHITECTS

ENGINE HOUSE NO. 1 HOWARD STREET, S. F.
WARD & BLOHME ARCHITECTS



PERSPECTIVE, ENGINE HOUSE NO. 37
HEARD & BLOHME, ARCHITECTS

ENGINE HOUSE NO. 8, PACIFIC AVENUE, SAN FRANCISCO
JOHN REID, JR., ARCHITECT

ENGINE HOUSE NO. 5, POWELL STREET, SAN FRANCISCO
Ward & Blohme, Architects

The construction of a fire house with all of its intricate essentials requires a vast amount of special study.

The San Francisco public hospitals have the reputation of being the best in the world, and it has been the aim of the Board of Fire Commissioners and the Board of Public Works to keep pace with this reputation in the construction of the Fire Department houses, their belief being that in so doing they will make for the highest efficiency possible in the department.

Every house illustrated herewith was built well within the budget appropriation. The recent records of the department show that neither the people's money nor the Fire Commissioners' efforts have been wasted.

*
* *

They Smile—And Then Pay

This letter is sent by a western merchant to those customers who are habitually careless in paying their bills: "Dear Sir:—If you will pay the enclosed bill, now fourteen days overdue, you will oblige me. If you do not I will oblige you." Every debtor sees the point. Most of them smile and pay up.

City Planning Progress in California*

By CHARLES HENRY CHENEY, A. I. A.†

WHAT little recent progress we have made in California in city planning and zoning is due, I believe, to the fact that we have constantly tried to provide the proper machinery before we attempted to do anything. No matter how high our ideals, nor how big our plans, we have tried always to make the next step the logical and sensible one.

For some years we had seen our architects bringing forth splendid suggestions and plans for civic improvement, and yet almost invariably little came of these suggestions because there was no means for carrying them out.

The California Conference on City Planning.

About four years ago several of us agreed that the first constructive step must be to make it definitely somebody's business in each city to plan, so we organized the California State Conference on City Planning, meeting at the same time and place as our League of California Municipalities, which is a very strong organization, and well attended at its annual sessions. Mr. Olmsted wrote us a letter of encouragement and advised a loose working organization, which was most successfully effected with the right people behind it.

This State Conference went to the Legislature of 1915 and got laws passed for the establishment of city planning commissions in all cities, and requiring the approval of the City Planning Commission to all maps of new subdivisions before they could be legally filed, even for tracts three miles outside the city limits. As a result, in the past two years nineteen city planning commissions have been established in California and two more are authorized by ordinances but not yet appointed, with ordinances pending in several additional cities.

Zoning the First Fundamental Step in City Planning.

We have found, just as some of you did, that zoning is fundamental to all sensible city planning, and in general must be the first practical step. So it was interesting to us to note in the Municipal Year Book of 1916 that two of the greatest city planning achievements of the year are given as the New York Zone Ordinance and the Berkeley, California, Zone Ordinance.

Los Angeles, of course, deserves the credit for being practically the first city in this country to have a comprehensive zone ordinance, having established in 1909 general industrial, residential and business districts, which have been several times upheld by the United States Supreme Court. As you are to have a paper from Los Angeles on the workings of this ordinance, I shall not refer to it further.

Framing the Berkeley Ordinance.

Berkeley, which is a residential suburban city of 50,000 in a metropolitan area of a million people about San Francisco, is also the seat of the University of California. It corresponds somewhat in setting to Mont Clair, New Jersey, and the other suburban towns forty minutes from New York, though more densely built up.

When, in the fall of 1915, the Berkeley Civic Art Commission came to study zoning as the first step to city planning, we decided that the Los Angeles ordinance did not adequately protect that largest portion of the city—the residential districts—so we studied the Minneapolis and the New York ordinances particularly.

*Paper read at the Ninth National Conference on City Planning, held in Kansas City, May 7-9, 1917.

†Architect and Consultant in City Planning, San Francisco.

We were most fortunate in already having had the New York Heights of Buildings Commission report. Mr. Geo. B. Ford also very kindly wrote us interesting and valuable side lights on how they had managed.

Ninety Per Cent of the City Single Family Residences.

But in Berkeley 90 per cent of the city is made up of detached single family residences. If we chose an ordinance districting the whole city at once, as in Los Angeles or New York, we foresaw that we should have to make it very general, like those ordinances, as the public in a short time could only be educated that far, and would be likely to misunderstand stiffer regulations or protections.

We found Minneapolis attempting the protection of single family residence districts, also our seeming greatest need, yet using the optional method of waiting until a petition from the property owners affected was filed before establishing any portion of the city under the zone ordinance.

We therefore decided that the ultimate segregation of single family residence districts, although a new departure, must be the thing to finally work toward, and we adopted an amplification of the Minneapolis method as the most desirable means of educating the public to our final necessities.

We believe that our ordinance as passed* has successfully done this. It provides twenty-seven classes of districts; we shall probably never have to use all these classes, but the machinery is there if we need it. Some districts we may establish in Classes XVI and X (which latter also includes Classes I, II, III, IV and V), thus permitting both wholesale and retail business, where in an outlying residence neighborhood we would only establish small retail business centers of Class X.

Distinctive Features of the Berkeley Zone Ordinance.

There are two particularly distinctive features of this Berkeley zone ordinance: First, that it provides for single family residence districts, two family, group house, and apartment house residence districts, each protected from the other and from business and industry. The second feature that is important is that new residences are prohibited in industrial districts. We had seen many examples of industries hampered and held back by small residences and tenements.

Some manufacturers said to us, "Why, if the city keeps factories out of residence districts, should not residences be kept out of factory districts? We find in most cities the most abject poverty and the worst tenement and bad housing conditions in the factory neighborhoods. When we want heavy traffic pavement for heavy hauling with spur tracks in the sidewalk areas, these owners of deteriorated homes appear before the City Council and holler so loud that the improvements are held up. So we have dejected housing and hampered industry."

We therefore provided in Berkeley that no new residences might go into factory districts and this has not yet been under attack.

This provision further has the effect of concentrating the industrial areas, and to limit, or rather discourage, the general tendency on the part of speculators to exaggerate their size, scattering the industrial district over much more area than it can probably ever occupy to its best advantage.

Careful Surveys Made of Each District Before Establishment.

During the past year, since the Berkeley Zone Ordinance went into effect, the City Council has received eight petitions for the establishment of districts under the ordinance, which have been referred to the Civic Art Com-

*For printed copies of the ordinance, No. 485 N. S., apply to the City Clerk, City Hall, Berkeley, Cal.

HAMPERED INDUSTRY AND DEJECTED HOUSING, BOTH AT A DISADVANTAGE FOR LACK OF A SENSIBLE, CAREFULLY PLANNED ZONE ORDINANCE

mission for recommendation. These petitions were carefully checked up with a card system by the consultant to the commission, an investigator visiting each building in the proposed district, noting the use, height of building, assessed valuation, attitude of the owner, etc. The findings and recommendations on these district surveys are interesting.

District No. 1, petitioned to be established as a Class I single family residence district, comprising nearly a square mile of the best residence section of Berkeley, where the original building restrictions imposed by the real estate tract developers had recently expired. The survey showed:

275 parcels of land, averaging 50 feet front, containing
208 single family residences;
4 two-flat buildings;
2 converted apartment houses;
1 private school;
60 vacant lots;
Ninety per cent of houses occupied by owners;
$1,250,000 estimated value of land and improvements.

On the basis of this survey we recommended that the petition be granted, giving exact reasons why this should be maintained as a district for single family residences only.

The Reversionary Clause.

The Commission then called a hearing of all the property owners in the proposed district, at which only a few objectors appeared. In order to make the operation of the ordinance uniform within the district, while not driving out the existing flats, converted apartment houses and school, we resorted to

what is called our "reversionary clause," stating that these existing misfits could stay there as long as they were not burned or moved, or altered, but that as soon as they attempted to make a change the property would have to be used for single family residences only, reverting to the same use as the surrounding district. This protected the people who had built the school, the flats and the apartment houses in good faith, and yet gave them reasonable time and notice to get out eventually.

The New York ordinance has a similar reversionary clause, providing the alteration is more than 50 per cent of the value of the building. We believe that this may leave the way open for a great deal of trouble in New York.

This district was then recommended by the Civic Art Commission to the Council for establishment, and the Council so acted in July, 1916, nearly a year ago, and we have had but one complaint against it since, and that from an owner of a converted apartment house, who desires to tear down and build a new building, against the protest of all of his neighbors. So far we have steadfastly refused to countenance this.

District Petition No. 2 asked that a district of Class V for apartments and all types of flats and dwellings be created over about three blocks of an old section, rather gone to seed, near the heart of the city. Our survey showed:

40 single family residences;
12 two-family residences;
2 converted apartment buildings;
2 Japanese laundries and residences;
1 Chinese laundry;
1 construction camp and stable with 6 horses, cow, etc. No buildings in the district over two stories in height.
80 per cent of the district occupied by renters.
10 per cent of lots vacant.
$300,000 approximate value of district.

In analyzing the reasons why this district had deteriorated we found that practically all of its troubles traced back directly to the old construction camp and stable. Fumes and odors from it made the three adjoining houses to the windward impossible to rent to any but Japanese tenants, who demanded no repairs and operated laundries in these houses. There was also one Chinese laundry on the next street, which made adjoining property a block away undesirable, with consequent lowering of rents. We therefore recommended to the Council that the construction camp and laundries must be entirely eliminated, and further that the petition be granted permitting flats and apartments, provided they were not more than two and one-half stories in height, as per our Class IX of the ordinance.

District Petition No. 3 asked for the classification of about one square mile of the best residence area of the city adjoining the University of California as a single family residence district of Class I. The survey showed:

294 single family dwellings;
9 two-family dwellings;
3 group dwellings;
10 boarding clubs or fraternity houses;
1 private school;
1 creamery;
1 sanatorium;
2 large barns with five horses each;
$3,000,000 approximate value of district and improvements;
254 lots built upon and 131 lots vacant.

Although there were 150 petitioners for this district, strong opposition developed from a small coterie of selfish land owners, who desired to improve their property at the expense of their neighbors, regardless of the result, and who inflamed public opinion in the district as to constitutionality and every other objection possible to the ordinance. Over twenty-six neighborhood meetings have been held in this district, and two hearings by the Commission, but as yet no complete agreement has been arrived at.

District Petition No. 4. About three square blocks of high class residence district applied by classification under Class II, which permits flats. A survey showed that there was not one flat building, and only single family residences in the district as proposed. The petitioners were recommended to submit a new petition for a district of Class I, rather than to encourage the building of flats in their neighborhood. The Commission felt that whatever classification is once established, the district may be expected eventually to build up to.

District Petition No. 5; for the protection of a new church in a residence district, granted after several stormy meetings.

District Petition No. 6, asking for the establishment of one and one-half square miles of high-class residence district, as a district of Class I, for single family residences only; three-fourths of which was already under private restrictions for single family residences, and the balance of it permitted business and flats. The survey showed that no business or flats had ever been built, except upon five lots out of two hundred or more thrown open to these uses; that the whole neighborhood was practically a single family owners district, which desired to maintain its home character.

The petition was recommended to the Council to be granted, with the addition of several adjoining blocks, and will be established this month.

District Petition No. 7. A new manufacturing plant expecting to invest a large sum of money on buildings covering about two acres of ground, was afraid to proceed on account of the existence of the zone ordinance, and until the property has been classified as an exclusive manufacturing district. The petition was recommended to the Council and the district established by ordinance.

District Petition No. 8. A residence district of about three blocks became alarmed over the possible location of a negro dance hall, on a prominent corner, and petitioned for establishment as a district of Class V, permitting apartments, flats and all kinds of residences. Survey of this district showed that only single family residences and flats existed at present, with 90 per cent of the lots built upon. The petitioners were recommended to bring in a new petition for a district of Class II, permitting single family residences and flats only, which they immediately did, and the Council has just passed an ordinance establishing the district. (May, 1917.)

The above examples serve to show practical laboratory work in city planning which we have been doing in Berkeley, and how zoning for single family residences is not only essential, but in demand and ready to be fought for by the people themselves. Every city in the country, we feel, has got to come to it sooner or later, and we believe that by being careful, ironing out the misunderstandings, and treating everybody fairly, without too much pressure on existing misfits and intrusions, that we can firmly establish this great principle of protecting the home against the intrusion of the less desirable and floating renter class.

Other Cities Warned to Go Slow on Single Family Residence Districts.

However, we warn other cities to be most careful about establishing single family residence districts. No city should do so unless it is prepared to

spend whatever is necessary for adequate legal advice to carry the matter to the United States Supreme Court if necessary.

In San Francisco the matter of zoning presents quite a different problem, because the city is built on a peninsula surrounded by water on three sides, and has grown up in a very congested manner, similar to certain areas of New York. Yet we find 50,000 single family residence buildings in the city, and 70,000 more vacant lots, a large proportion of which, however, are steep hill tops, unsuitable for building purposes. It is probable that the zoning of San Francisco will be much more difficult than in Berkeley, or other more open and spread-out communities. There is hardly a block in San Francisco which has not one or more intrusions, or misfit uses of buildings. In this it is not different from Chicago, New York, or a great many other cities.

Need of Districting in San Francisco.

The Commonwealth Club of San Francisco has recently sent out a questionnaire to all the improvement clubs of San Francisco and to the assessors of adjoining cities, asking as to the need of zoning ordinances. In reply sixty-six specific complaints of intrusions have come in, showing where residence districts have been wrongfully invaded with consequent deterioration and loss of rents to the neighborhood. These complaints are as follows:

12 against shops;
10 against laundries;
7 against stables;
5 against garages;
3 against flats;
2 against nurseries;
2 against quarries;
2 against an acid factory,

and others against saloons, old shacks, car barns, lumber yards, fire houses, breweries, etc.

The improvement clubs generally replied that there is great necessity for districting, and that it only wanted a general organization movement to establish a zone ordinance in the city.

Last year the assessor of San Francisco had to reduce by 50 per cent the assessment on some ten built-up blocks because a tuberculosis hospital had been located by the city in the neighborhood, and the adjoining neighbors moved out for fear of contagion.

The losses in taxable return to the city in one year alone were thus almost equal to the cost of the hospital. No policy for establishing hospitals in certain definite zones or districts has ever been worked out.

Typical Letters Showing the Need of Zoning Regulations.

We began to receive letters also, like this—from an old lady:

"I am the owner of two small flats on Broderick street, near Cole, which have greatly depreciated in value owing to an automobile repair shop which has come next door. The rentals from said flats are very low, but are my only source of income. One of my tenants has given notice that she cannot continue to occupy the premises owing to the dirty condition of the place adjoining, and the procession of automobiles constantly before her door. She finds it impossible for her to keep her home in a state fit for her friends to visit her.

"It will be a serious pecuniary loss to me to have her vacate and I shall find it extremely difficult with such an environment to obtain another tenant.

"No reduction in the assessed valuation of my property has been made, although some time ago I applied for a reduction and was refused."

The City Assessor of Oakland wrote as follows:

"In reply to yours of December 5th, will say that the subject matter therein is of great interest to me, not only as the Assessor, but as a citizen of Oakland. We have such cases as mentioned by you practically in all parts of the city. I believe you will find such cases in all growing communities.

"We have furnished you three cases as you requested. Another angle of this case is also coming under our observation. An apartment house has been built within a strictly residential neighborhood; said apartment house covers the entire property. Residences have been set back some twenty feet from the property line. The residence immediately adjoining the apartment house lot is certainly depreciating to a considerable degree, and we recommend the claim for a reduction in assessment. The question now arises as to the value of the land on which the dwelling is located. If the apartment house sentiment is strong enough, of course it makes the land more valuable, and we believe should be assessed on a basis of value for the highest use to which it might be put; however, it is pretty hard to get the owner of the residence to agree in this view, as he says, 'I do not wish to sell.'"

It is evident, therefore, that San Francisco and vicinity is about ready to adopt zoning regulations and that we are stimulating public opinion in the right direction by the methods quoted

The New California State Zoning Act.

In order to give our smaller unchartered cities authority and the procedure under which to zone or district themselves as Berkeley has done, the Third California Conference on City Planning went to the Legislature last January and has just secured the passage of a State-wide zoning or districting act,* which also will be of great moral encouragement to our large chartered cities. The Act provides as follows:

"1. For the public interest, health, comfort, convenience and welfare, the City Council of any city may by ordinance divide the city into districts, limiting the use, height and bulk of improvements.

"2. These districts may segregate the various classes of business and industries and determine the specific locations for apartment houses, for two-family dwellings, and for single family dwellings.

"3. Hereafter no such district shall be established by any City Council until the city planning commission shall have made a report and held a public hearing."

We believe that this is one of the biggest steps in city planning progress yet made in this country, for the reason that we have now the authority of the Legislature behind us for establishing single family residence districts, and we have had such districts already established without contest for a year in Berkeley. This new Act also gives a new power definitely to the City Planning Commission to take up that most fundamental of all matters of city planning—the setting aside, for the best use, of each portion of the city.

Our eighteen planning commissions in California are getting ready to act immediately under this authority. We are preparing new ordinances for Fresno, Palo Alto, San Rafael and Turlock, and we expect to have these ordinances established within three months.

We Look to the Constructive Help of Our City Attorneys.

When we come to you to report next year, we anticipate that there will be at least forty city planning commissions in California, and we want you to know that it is because of the splendid discussions and edu

*Senate Bill No. 430. Copies may be had of the Secretary of State, Capitol building, Sacramento, Cal.

cational work of the National Conference and the men who are working so hard for better city planning in our Eastern cities that we in California have had the courage and the energy to proceed. We believe in tackling our ultimate problem of taking care of the home owner, because we believe he is the mainstay of our citizenship.

Above all, we look to the help, guidance and constructive thought of our attorneys. We rejoice to see them take the hopeful view. We know that we are going on new and delicate ground without a great deal of precedent, and yet we have seen Los Angeles establish several times in the United States Supreme Court the entirely new principle of zoning, which only fifteen years ago we are sure would have been thrown out of court.

We know that the courts are progressing in their ideas as well as the rest of the world. We city planners, and I think I may speak also for our City Planning Commissions, therefore ask every effort on the part of our attorneys to help us establish these great principles of social justice. Surely no greater work lies before us.

* * *

A Community Court of Revolutionary Type

"Roadtown" is the novel idea of an inventor named Mr. Edgar Chambless, who has conceived an entire city with an ideal transportation system shooting out into the country in a straight line. Engineers, city planners and efficiency experts have marveled at its possibilities.

While studying the transportation problems of New York City, trying to figure out a subway system for freight delivery, Mr. Chambless evolved a housing scheme, a series of towers, like smokestacks, joined and braced from outside, each apartment an entire floor with air and light on all sides, easily accessible by fast elevators, to be built of concrete, 225 stories high—and engineers pronounced it possible! Suddenly, in the night, the idea came to him to take the towers down and lay them flat on the ground—to build out into the country, not into the sky.

This, then, is the plan for the city in the country. The houses, whether 100 or 1,000 are all in one line. The basement is a continuous passage, with a noiseless and well-ventilated system of transportation. Each house has its own stairs to the platform, which runs the entire length. In this basement are the conduits for all the pipes and wires of Roadtown. Having gas, water and electricity in a straight line is one of the great economies of the new city. Every apartment has on two sides air and light. The two ends partition off the adjacent houses.

The country, with gardens and farms, is immediately accessible at every point. Within a half mile on either side there are two acres of land for each family, sufficient, the intensive agriculturists assert, for their support.

The roof of this long line of houses is also a continuous passage.

* * *

And It Was a San Francisco Girl, Too

A young woman was visiting a friend in an architect's draughting room the other day and made the following exclamation upon being shown a longitudinal section of a theatre: "Oh! that's a view of the front as if there were nothing!"

MILL CONSTRUCTION FACTORY BUILDING, FOR CATHERINE DUNNE COMPANY
Alfred Kuhn, Architect

The Standard Slow Combustion Building

(So Called Mill Construction)

By ALFRED KUHN, Architect*

WHEN the construction of a commercial or factory building is being considered by the architect who wishes to protect his client in the matter of fire hazard, wood framing being considered out of the question, reinforced concrete seems to be the only alternative.

This is partly due to the mistaken idea that seems to prevail, especially to the layman, that any timber construction is hazardous, must therefore be tabooed, and is associated with the old type of joist constructed building—that old fire trap, with the open elevator hatchway and stair well, through which the fire roared, spread from floor to floor and was soon beyond the control of the firemen; then falling walls and total destruction.

The fact of the matter is, that long before the present era of reinforced concrete, the very best type of brick masonry and wood frame structure was developed to the highest degree of fire retarding efficiency and which even today when it is properly designed and constructed will command a very low rate of fire insurance, the Standard Slow Combustion building. It represents to my mind the best type of building for warehouses, factories or similar structures, when properly designed, in point of economy, time required in erec-

*Pacific Building, San Francisco. Copyright by The Architect and Engineer of California, July, 1917. Three of the photographs accompanying this article were furnished through the courtesy of the National Fire Protection Association.

tion and simplicity of construction and is especially good for factories that require mechanical equipment, on account of the easy manner that it can be installed, due to the heavy wood framing and open ceiling.

The cost compared with the reinforced concrete building is greatly in its favor, considering the little difference in the insurance rating, the basic rate on the slow burning being 38 cents and on the concrete building 33 cents, with a reduction of 50 per cent if the building is sprinklered.

In view of the fact that the admirable qualities of the standard slow combustion building have been somewhat overlooked on this coast, where an abundance of fine framing timber, Douglas fir, is so close at hand and inexpensive (i. e. when normal prices prevail) a few words on this excellent form of construction, considering the present steel situation, may be of timely interest.

Slow combustion construction, as applied to buildings used for commercial purposes, was developed from mill framing or mill construction (hence the name) where on account of extreme fire hazard it had been put to severe test and proved so effective, that its use was extended to wholesale houses, warehouses or similar buildings, with the framing modified, of course, to meet the various loads and requirements.

In the original mill construction the posts were twenty or twenty-five feet apart and beams eight to eleven feet on centers, according to floor load required; the carrying floor three inches thick or as needed and spanning from beam to beam. The weight of the milling machinery being directly over the framing, leaving the aisles in center between spans, where very little load was required; an ideal floor construction for the purpose. Each floor was cut off from other floors, each compartment from other compartment or section, so that fire, often caused by spontaneous combustion or explosion, could be confined and not communicate from story to story, and every precaution was taken in the details of construction to prevent this. The floors were made water proof to prevent damage by water to story below and graded to wall scuppers so that it could drain off when the floors were flooded, or to elevator shaft when scuppers were not provided.

These main essential details were retained when applied to commercial structures; the spans or bays, however, had to be increased in width and length adjusted, requiring heavier girders and intermediate heavy framing of beams which were placed as far apart as the uniformily distributed floor loads would permit; the heavy carrying floor being exposed underneath made an extremely fire resisting ceiling with the heavy intermediate open framing, the main principle of slow burning, and far more pleasing in appearance than the exposed joist construction of the class C building.

No architect when planning a commercial building should apply, without a struggle for a better structure, that abominable type of fire trap, known as a joist constructed building; joists spaced twelve or sixteen inches apart and two or three inches thick which furnish many excellent projections and corners that ignite easy and burn like tinder, especially if sealed underneath, the space between the joists forming pockets where the fire lodges and is so hard to extinguish until the floor burns through. A slight fire would burn each surface of the joist and make it useless as a floor support, whereas on the other hand the same fire would not affect the heavy floor and timber construction in the slightest degree. I have the interior of a slow combustion building in mind that had been subjected to a quick hot fire, where the timbers had only slightly charred on the surface and all framing not disturbed in any way; the same fire in a joist constructed building would have caused the floors to burn through and spread

INTERIOR, SHOWING OFFICE FIXTURES, GIMBEL BROS.' CANDY FACTORY
Alfred Kuhn, Architect

In early examples of slow burning structures, when floors were heavily loaded, it was common practice to make the girder in two pieces bolted together with one inch space between allowing quicker seasoning and providing better ventilation for the timber to prevent dry rot. This form was, however, soon discarded as more surface was exposed to the fire which lodged in this space, often preventing its extinction and causing the floors to collapse.

In the best practice a standard slow combustion building should have a floor area not to exceed 5000 feet per fire section unless equipped with a standard sprinkler system; by fire section is meant a portion of the building cut off by standard fire walls, preferably brick. The height of the building should not exceed 65 feet above the average grade level and no story to be over 15 feet in height; the basement is considered a story if the distance between the bottom of the overhead girder and the average ground level exceeds three feet. The floor areas can be increased when sprinklered, also height of building, an eight story building being about the maximum for height.

All stairways and elevator enclosures must be of brick or concrete, and all openings to same provided with standard fire doors with fusible links and self closing, to prevent fire communicating from floor to floor, and all exterior openings exposed to fire hazard from adjoining buildings must have metal frames and wire glass, or fire shutters of standard make, metal covered

WOODEN TIMBER VS. UNPROTECTED STEEL BEAMS

The fire in this mill did not affect the stability of the wooden timber, although the ten-inch steel beams sagged and were twisted to a degree which required rebuilding. The wooden beam was used in the frame because not enough steel had been ordered to complete the work promptly. In rebuilding, wooden beams were used throughout.

It is essential that the best protection be provided to guard against fire entering a building, a point that is often overlooked or disregarded on account of expense, and because of the general practice of this false economy many buildings are often gutted and their contents destroyed; metal frames and wire glass afford the best protection, as fire shutters are as a rule always open when an adjoining fire threatens. Of course we all know that there is no such thing as a fire proof building in a conflagration, nor will anything save a structure so exposed, but every means should be taken to check the fire—make the building as fire-resisting as possible; because such precautions are not the general rule valuable surrounding property is destroyed annually which otherwise could have been saved.

In the slow combustion building, one of the most important items is the kind and quality of lumber and for the framing timbers a grade should be used that possesses high strength values, composed of strong dense fiber and free from all defects which would render it unsatisfactory for durability or strength; Selected Structural Douglas Fir Timbers meet all these requirements.

The posts must have a sectional dimension of not less than 64 square inches, superimposed throughout all stories on metal caps pintle and base plate; the caps receive the beams and girders. Various good forms of steel caps are on the market, altho cast iron caps are often used to good advantage and can be designed to meet exact requirements. Posts should be ventilated to prevent checking and to guard against dry rot.

Beams resting on walls are received in metal wall boxes, with sufficient space around the end of timber to allow circulation of air, and so designed that in falling the ends will be self releasing and not damage the wall; the beams are supported at the girder with wrought iron stirrups, or hangers, malleable hangers are to be preferred as they have been subjected to severe tests in various fires and are not affected by excessive loads.

Several years ago at the Washington University in St. Louis various types of hangers and stirrups were tested and the best type of malleable hanger failed at 39,550 pounds; a single wrought iron stirrup ⅜ by 2½ inches, however, sustained a load of 13,750 pounds before failure took place. The strap or stirrup hanger will take care of all ordinary requirements, but I prefer the Duplex hanger for strength, and its simplicity of design permits it to be placed quickly; the holes that receive the spools do not weaken the girder, which has been proven by actual test, and another great advantage that it has, the effect of shrinkage is reduced and it eliminates any cutting of beam or flooring that is necessary when the other type is used.

The carrying floor should be not less than three inches thick and covered with two layers of building paper, the bottom layer well mopped with pitch, and flashed at least three inches in height on all wall lines to make floor water tight; the floor is graded to wall scuppers or other outlets so it can drain off when flooded. On top of this floor the wearing floor is well nailed and made as tight as possible. At each floor level where there is no offset in the wall, corbel out with a ledge, which acts as a fire stop and prevents fire communication.

As a rule, 10 per cent moisture is permitted in all framing timber, and for this reason no oil paint, or varnish, must be used until the wood is thoroughly seasoned, as this prevents evaporation and fermentation of unseasoned wood (dry rot) often takes place; cases are on record where entire buildings have collapsed from this cause. If painting is required, cold water paint is permissible; this will not prevent the wood from seasoning, which ordinarily takes about three years, depending on the amount of moisture it contained

A SUCCESSFUL FIRE STOP

Showing satisfactory fire retardent service of metal window frames and wire glass. Warehouse opposite side twenty-foot alley was totally destroyed. Windows at rear were broken when side wall of burning building fell.

when placed in the building; oil paint, or varnish should not be used under any circumstances, as it would make the woodwork highly inflammable and defeat the main and important object of slow combustion construction, which is fire-retarding.

* * *

The four-story building illustrated in this article was just recently completed at First and Folsom streets, San Francisco, by the writer and is a fair example of standard slow-combustion construction. It was erected for the Catherine Dunne Co., and so constructed that two additional stories can be added. Mr. G. P. W. Jensen was the contractor.

The building will be occupied by Gimbal Brothers, the well-known local candy manufacturers, who plan to have the most modern and best equipped

A STANDARD FIRE DOOR

In a large paper warehouse, where everything in one section was destroyed by fire, a line of standard tin-clad fire doors effectively protected all stories of the adjoining section. The accompanying photograph shows one of these doors.

candy factory on this Coast, and every convenience has been provided for the comfort of their many employees. The office and show room are of special design in gray oak, paneled walls and beam ceiling. Attractive cases for displaying the company's great variety of confections have been installed by the Mullen Mfg. Co.

Mr. Chas. T. Phillips was the consulting engineer on the mechanical installation.

* * *

War Prices

A Tommy on furlough entered a jeweler's shop, and, placing a much-battered gold watch on the counter, said: "I want this 'ere mended."

After a careful survey, the watchmaker said: "I'm afraid, sir, the cost of repairing will be double what you gave for it."

"I don't mind that," said the soldier. "Will you mend it?"

"Yes," said the jeweler, "at the price."

"Well," remarked the Tommy, smiling, "I gave a German a punch on the nose for it, and I'm quite ready to give you two if you'll mend it."—Tit-Bits.

DESIGN FOR CENTRAL LIBRARY AND CIVIC CENTER, LOS ANGELES
SIEGFRIED GOETZE, ARCHITECT

New Branch Libraries in Los Angeles

DETAIL OF ENTRANCE, NORTHEAST BRANCH LIBRARY, LOS ANGELES

LOS ANGELES recently has completed six branch library buildings at a total cost of $210,000, and the next step will be the construction of a $3,000,000 central library building, for which a bond election is being planned. The Library Board has selected as a site for a central building the northern half of the block bounded by Fifth and Sixth streets, Olive street and Grand avenue. Speaking of this site and prospects for a building thereon, Librarian Everett R. Perry writes:

"The board considers this the most accessible site available in the downtown district. Indeed, it was selected for its accessibility to the business men of the city, who can easily reach it from their offices, while it is only a block or two from the stores.

"Los Angeles hopes before long to have a new central library building which shall not suffer by comparison with the beautiful structure recently completed in San Francisco."

Of the completed branch libraries, the Northeast branch is the best example of unusual treatment. The architects, Messrs. Hibbard & Cody, were called upon to design a building whose two facades, facing two streets of the same prominence, would be equally attractive. The pictures show how splendidly this has been done. The building is built in the form of a quarter circle, with a 14-foot extension at each end. Another problem which has been successfully solved in the design of this building is the provision made for perfect supervision of the reading and stack room from the central delivery desk, located just inside the entrance and facing the door. From the delivery desk a perfect view can be had of both wings of the quarter circle.

On the back of the main building is added a wing in which is included a stack room 36x38. This room has three arches leading to the main building. A perfect view can be had from the delivery desk of the stack room through these three arches.

The main reading room is elevated and the windows are placed unusually high, so that the light is diffused down, without casting any shadows on the interior, a feature which is very desirable to persons reading. The lighting system is semi-indirect. Both exterior and interior leaves the impression of a strong Italian feeling.

The furniture was designed by the architect especially to carry out the design as far as practical with the working requirements of the library.

In place of the open-air reading room with which the Los Angeles libraries are usually equipped the rear portion of the lot has been beautified with flowers and grass and fenced in with an ornamental lattice-work, over which a strong, heavy chicken wire is stretched, to serve the double purpose of preventing the loss of books and to carry the vines which furnish shade in summer to the outdoor readers.

NORTHEAST BRANCH LIBRARY, LOS ANGELES
Hibbard & Cody, Architects

In the basement is an auditorium seating 350 persons, with entrances from the front and rear.

The Arroyo Seco branch library, Mr. F. M. Ashley, architect, is built on modern classic lines, with four fluted Ionic columns in front and seven on each side. To mask the feature of converging lines, a circular porch was used on the front.

Although there is a great difference in the level of the two streets on either side of the building, this has been overcome by a careful grading of lawn in front and terracing at the side.

The building is constructed on a "V" shaped lot at the convergence of two streets. At the end of the main walk is a flag pole circle and steps.

CAHUENGA BRANCH LIBRARY, LOS ANGELES
C. H. Russell, Architect

VERMONT SQUARE LIBRARY, LOS ANGELES
Hunt & Burns, Architects

which pick up the difference in street elevation. The street to the right of the building is seventeen steps higher than the street to the left.

The lines of the library correspond exactly with the lines of the two converging streets on either side. The foundations are of concrete. Above the foundation comes cream pressed brick with old gold brick panels, trimmed with art stone. The flat roof is concealed by a brick parapet studded with lights for night illumination.

VERNON BRANCH LIBRARY, LOS ANGELES
Kysor & Biggar, Architects

ARROYO SECO BRANCH LIBRARY, LOS ANGELES
F. M. Ashley, Architect

The interior coloring is a rich cream, with a two-tone effect in the delivery room. The walls are stenciled, while the furniture and woodwork are in American white oak.

All floors are of reinforced concrete, with tile floor in the delivery room. Cork linoleum is used on all reading room floors, making them practically noiseless.

The Boyle Heights branch, Mr. W. J. Dodd, architect, is unique in that it has the auditorium on the first floor and has a foreign literature room to

BOYLE HEIGHTS BRANCH LIBRARY, LOS ANGELES
W. J. Dodd, Architect

accommodate the many foreigners who reside in the community. The general style of the building is Spanish Renaissance. The reading room is finished in oak. The building has an open-air reading room with lattice top and sides. The roof is of red terra cotta tile, while the cornice is wood and terra cotta. The window trimmings are in terra cotta.

The Cahuenga branch, Mr. C. H. Russell, architect, is built of gray and tan ruffled brick. The roof is of red terra cotta tile. The furniture and interior is finished in golden oak. The color treatment of the interior is in brown shades. The ceiling over the adult and children's room is barrel shaped, the window openings forming a groin effect. The lighting system is indirect. In the basement is the auditorium, seating 300. Here is also the heating and ventilating plant, boys' clubroom, a kitchen, children's reading room, toilets, etc.

In the Children's Room of Cahuenga branch there is inset in the north wall a bas-relief of "The Harvesters," adding much to the attractiveness of the room.

The Vernon branch, Messrs. Kysor & Biggar, architects, is built of special rug brick. It is of the accepted standard clover-leaf plan, enabling one person to supervise all the rooms. The interior is finished in a light gray color. In the children's reading room is a frieze which extends entirely around the room, with subject matter of interest to children. The outdoor reading room may be enclosed and heated in cold weather. Indirect lighting is used throughout the building.

The Vermont Square branch, Messrs. Hunt & Burns, architects, is built in a beautiful public park. It is in the Spanish Renaissance and constructed of light mat-glaze terra cotta and light buff semi-glaze brick. The roof is of Spanish clay tile. Indirect lighting is used, while the inside is finished in a light tan color. The rooms have a low wainscoting. The partitions are largely of glass, so the attendants can have a view of all the rooms. The furniture and interior finish is in oak. The vestibule is paneled with marble. This was the first of the branch libraries to be completed.

*

* *

Detroit Architect is Designing 57 Story Hotel

Mr. F. Swirsky, architect, of Detroit, Michigan, is preparing plans for a $15,000,000 hotel and office building to be erected on Michigan avenue. The plans are for the tallest building in the world—57 stories—capable of sheltering 10,000 people in hotel rooms and offices.

The building will be a city sufficient in itself, with a postoffice, police station, arena seating 16,000 people, a quarter mile track, and an auditorium. Plans call for a 27-story hotel and 57 stories of offices, running up into a tower, 808 feet high, as compared with 780 feet at the Woolworth building, New York.

Two aeroplane landings 50 feet wide by 620 feet long, will be located on the roof, according to Mr. Swirsky. There will be 4312 rooms, renting for $1 and $1.50. In the basement will be located 504 display rooms for auto concerns and others. Sixty shops will be located on the first floor.

There will be seven banquet halls, two small convention halls, one serve-self, one dining-room, two ballrooms, and a hospital on the second floor of the building.

Standardized Steel Frame Construction

IN STEEL work construction on the usual methods of manufacture a large portion of the time required for production is occupied in design and calculation, the preparation of working drawings and details, the listing of parts, and making templates. Repetition work of this description represents valuable time lost, quite irrespective of the question of expense, which may be avoided by the adoption of the standard unit principle, with which this article, from the Engineer, deals. When post-war conditions prevail, a vast amount of work which was suspended owing to war demands will be proceeded with, and any system which will expedite and reduce the cost of building construction is worthy of consideration.

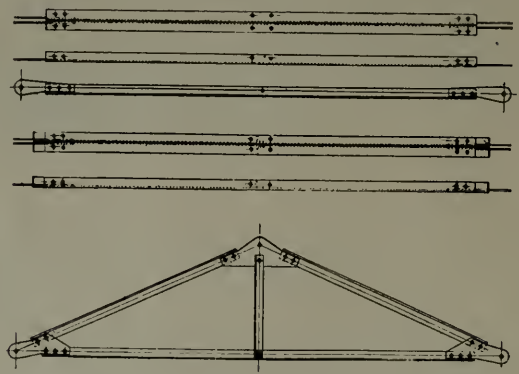


Fig. 1.—Standard Units and Parts

Standard units have been designed to simplify the erection of every description of steel structure, and at the same time to provide maximum strength and safety. The units are triangular in form, constructed of steel angles, which are bolted or riveted to steel plate corner gussets. The joint holes for the reception of a large diameter bolt are drilled in each gusset at the exact intersection of the central lines of the triangle sides. The bars are of steel angle section, and are provided with joint plates bolted, or riveted, to angle, and shaped out to accommodate the joint hole on the center line of bar for connecting up to the units in the structure. The flanges of units and bars are provided with standard holes for connection of purlins, rails, or bracing bars in the structure. All the various members are manufactured to standard templates, dies, and gauges, the units and bars being assembled on a stiff frame of exact gauge, thus insuring correctness of dimensions when the gusset plates are bolted up, and eliminating any slight inaccuracies of workmanship. The units and bars are also constructed in doubles, for the purpose of providing greater strength. Particular members of the lighter frames may be reinforced by the addition of standard bars.

The structures are pin-jointed, providing the simplest possible connection, and the joint bolt is of sufficient shearing strength to develop the full stress that can be taken in the members of the unit frames or bars.

The system is, therefore, admirably adapted for the construction of either permanent or temporary buildings of a light or heavy nature. It is also specially applicable to semi-permanent or emergency buildings which can be readily dismantled if desired and erected on a different site, whilst the style of building can be altered or modified by the addition of further units. By a suitable combination of standard units and bars, spans are obtained from 10 feet to 50 feet in closely graduated steps, and larger spans up to about 100 feet are obtained by building the standard frames or girders running crossways of the structure and carrying the roof covering on small cantilever trusses built up of single units and bars. The additional strength for the larger span girders is obtained by providing flange plates fixed through the standard holes in the units. An important advantage claimed for the standard unit system is the saving in cost and time in erection, as the interchangeability and accuracy of the standard parts insures rapidity of assembling. The standard bars and units are bolted, or riveted, up at the makers' works ready for immediate erection on delivery, and the dimensions are such as to provide for convenient handling and transit.

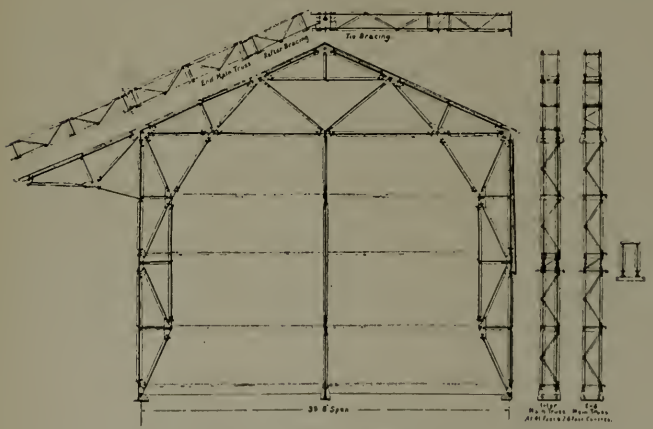


Fig. 2.—Cross Section of a Building Erected with Standard Steel Units

The connections of the standard parts require only one large diameter bolt for each joint.

A single 13-foot standard unit of the lightest section, under test, carried safely a load of 4,872 pounds, hung from each side, and in addition a central load of 1,568 pounds, making a total of 11,312 pounds. At the same time various other tests were carried out on riveted and bolted unit frames of single and double members, each arrangement of loading being supported safely by the standard unit. Loads of one ton each were hung from the pins on the base intersection of the single 13-foot unit frame, the base member being unsupported externally between the pins.

The same loads were hung from cleats fixed to the end standard flange holes in the base member of the single 13-foot standard unit, thus testing the effect of this eccentricity of loading. Similar tests were made on the

single 10-foot standard unit with the same loads. Loads of five tons each were also hung on the similar pins of a double 13-foot unit, the total load being the safe lift of supporting crane.

Fig. 1 applies to a building constructed on the standard unit principle. Unit frames are employed throughout the structure in columns, roof trusses, eaves, girders, and lateral wind-bracing girders.

Table of Safe Stresses

Tensions—8 tons per square inch net area.

Compression $\frac{7}{1+a\,(l/k)^2}$ per square inch gross area.

$a = \frac{1}{10{,}000}$ for pin ends and $\frac{1}{20{,}000}$ for flat ends.

Shear on rivets—6 tons per square inch.
Shear on bolts and pins—5 tons per square inch.
Double shear on rivets, bolts, and pins—1.75 times single shear.
Maximum fibre stress on pins in bending—11 tons per square inch.
Bearing pressure—12 tons per square inch.

As regards dimensions and clearances, the design adopted fitted exactly the requirements of a rather difficult site, where the sidings and surrounding structures were already built. The building is 111 feet long by 26 feet high by 36 feet 8 inches wide, with an overhang on the one side of 12 feet, the columns being spaced at 41 feet longitudinally to suit the requirements of the site. Standard units of 13 feet were employed throughout, either single or double, as required for purposes of strength.

With regard to the properties of standard units and bars, it might be mentioned that the standard unit has a base of 13 feet center to center of pins, and the secondary standard unit has a base of 10 feet to provide in combination with the 13 feet unit for a greater variety in dimensions. The standard bars are made of lengths as required, the straight lengths of angle being cut and punched with standard holes for attachment to the standard gusset plates at each end. The allowable safe stresses on mild steel for the various unit members are given in the table.

* * *

Building Trade Losing Good Men

The outstanding feature of the building situation continues to be the immense amount of construction work undertaken by the Federal Government in the erection of buildings at the numerous training and mobilization camps. Millions of dollars worth of work have already been contracted for and there is estimated to be an equal amount, if not more, in prospect that will be placed under contract during the coming months. The effect of this building movement on the part of the Federal authorities is beginning to be felt through the trade in all parts of the country not only by the fact that there has been a call for great quantities of building materials and supplies, but also by the effect on the labor situation. This military construction is taking the services of a great number of skilled mechanics out of the general building business, and while the result in some directions is good, there is no doubt but that the concerns specializing in private construction will feel the shortage for a long time.

Scope of An Architect's Authority

By A. L. H. STREET, in Building Age.

THE scope of an architect's agency for an owner of a building in course of construction or improvement has often been misconceived, as appears from numerous cases in which appellate courts have been called upon to determine whether supervising architects exceeded their authority in particular instances. It has been erroneously assumed that an architect possesses general authority in matters pertaining to the building entrusted to his superintendence. The true rule is that he is limited by the terms of the contract between the owner and the builder, except as his powers may be specially enlarged.

In many instances controversies have arisen as to the right of a contracting builder to rely upon directions given by the architect concerning extra work. For instance, in a Maryland case a cemetery company was held not to have been liable to the builder of a gateway for extra compensation for two windows added at the supervising architect's direction, where there was no compliance with a clause of the construction contract providing that "should any alteration be contemplated from the design it may be done, provided the parties beforehand agree upon the price and endorse it upon the contract." The Maryland Court of Appeals said:

"Owners are very much in the power of builders and architects. Changes, apparently unimportant, are often made, the first knowledge of which comes to the owner in the shape of an additional charge for extra work. It may have been to prevent this, and the controversy that often arises from verbal agreements supplementary to written agreements, that the parties had this cautious provision inserted. It was a clause for the benefit of both, especially for that of the owner. If the contractor, relying on the assurance of the architect, chose to perform this work without placing it within the protection afforded to the parties by the contract, he must bear the consequences. * * * The architect was appointed merely to superintend the work according to the plan, with such alterations as the parties might have agreed upon. As such superintendent he had no power to bind the company by promises in their name, whatever he may have thought of the extent of his authority."

Following this decision in a later case, the same court denied the right of a sub-contractor to recover $1,200 for plastering beams in an office building, as an "extra" authorized by the supervising architect, without the sanction of the owners. It appears that the building contract in this case was in the Uniform Contract recommended by the American Institute of Architects and the National Association of Builders.

The Illinois Supreme Court refused to hold an owner responsible for work done by an outsider employed by the supervising architect to replace defective work performed by an original contractor, the employment not having been sanctioned by the owner. The court declared that an architect's authority to supervise and direct work to be done by a contractor and those acting under him implies no power to engage an outsider to do work called for by the contract. In this case it was sought to hold the owner because he saw the work being done by the outsider, but the court decided that the owner was justified in assuming that the work was being done under a subcontract.

A builder was not justified in departing from specifications for the laying of a cement floor on oral permission of the architect, where the building contract required changes to be evidenced by written consent and order of the architect, according to a holding of the Iowa Supreme Court. That tribunal said:

"The architect's authority is limited. He may not direct the work to be done otherwise than is provided by the plans and specifications, except as he has been given authority so to do therein or by the contract. Unless so authorized he is powerless to relieve the contractor from complying with his undertaking in order to make it easier for him or for any other purpose, if this be detrimental to the owner. In adopting a different method than that prescribed the contractor did so at his own risk. It is not pretended that the architect's assent or direction to change was reduced to writing, and, in the absence of written instructions, the owner is not bound at all by what the architect may have done in these matters. That it may have been difficult to comply with the contract did not waive this rule, nor does this furnish any excuse for non-performance."

The Iowa court approves a statement by the Missouri Court of Appeals to the effect that provision in a building contract that the builder is to build according to directions of the architect should be construed to mean such directions as he may give looking to the completion of the work according to the plans and specifications, and not to mean orders at variance with the plans and specifications.

The same general rule led the California Supreme Court to refuse to permit a contractor to recover extra compensation for extending concrete walls eighteen inches higher than called for by plans and specifications, on mere oral request of the supervising architects.

And in an Arkansas suit the Supreme Court decided that a trial judge committed error in holding that delay in completing a building exonerated the contractor from liability for an agreed per diem penalty for delay if it was occasioned by the act of the architect in directing extra work. The higher court declared that even if the architect exercised honest judgment in directing doing of work which was unnecessary under the contract that would not prevent the contractor from being liable for a delay.

A decision of the Georgia Supreme Court shows that the limitation upon the authority of architects here discussed applies to purchase of materials, but that acts of an owner indicating ratification of an architect's previously unauthorized acts are the equivalent of precedent authorization. The court held that whether an architect who furnishes designs and undertakes to superintend the construction of a building is to be regarded as the owner's agent for the purpose of binding him personally for materials furnished to the contractor depends upon the contract between the owner and the architect. But whether originally so authorized or not, if the architect assumes to act as such agent, and buys materials upon the credit of the owner with the owner's subsequent assent tacitly given, the owner is liable.

Of course it follows, as declared by the Colorado Supreme Court, that if a construction contract indicates that final acceptance of the work is to be made by the owner, a supervising engineer cannot commit the owner in any way by his approval of the work.

Nor can the architect, unless specially authorized, waive conditions of the building contract upon which the contractor's right to payment of his compensation depends, although the architect's approval is made a condition precedent to payments to be made under the contract. A Massachusetts building contract provided, in effect, that the contractor would, under the direction and to the satisfaction of the architect, provide all materials and do all work called for by certain plans and specifications. Under this agreement it was said by the Massachusetts Supreme Judicial Court that the mentioned clause did not go farther than to make the architect the agent of the owner in the matter of deciding whether the work done fulfilled the requirements of the specifications and drawings, and did not give him authority to waive, in behalf of the owner, the terms on which the owner had stipulated that the payments were to be made.

Taste and Refinement in Hospitals

In recognition of the powerful influence of environment, hospital administrators are nowadays thinking about making their institutions attractive to all the senses. They invoke beauty of architecture and decoration to please the eye; harmony of sound, music, and quiet, in which harsh noises are prohibited, to please the ear; flowers and sweet scents (in place of the old-time hospital smells, iodoform and carbolic acid) to please the sense of smell; soft fabrics, blankets, and linens, and smooth, clean furniture, to please the sense of touch; and appetizing foods to please the sense of taste.

But we, as a progressive nation, are developing taste along some lines that have hardly been taken into account by hospital thinkers. A few years ago the "all-white" operating, dressing, and service rooms were regarded as the very last word on asepsis; and we have in mind a few hospitals in which the "all-white" fad was permitted to rule even in the private rooms, and white metal beds, white enameled dressers and tables, and white linen covers and shades were to be found.

It seems that we have well passed this stage of attractiveness now, and superintendents and trustees of taste and culture are planning for "pretty things" in furniture and accessories. That is why the idea of having well-to-do people of refinement furnish individual rooms has taken so strong a hold on the trained hospital mind.

It is a joy to go into a hospital and find evidences of good taste and refinement on every hand, the private rooms provided with attractive carpets or rugs, the windows tastefully draped and shaded, the furniture in pretty styles and of good material, well treated. And if the rooms are all different in their furnishings, each one striving, as it were, to be more inviting than the others, it gives one the feeling that the creature comforts and the sensibilities of patients, as well as their ailments, are given care and thought.

There is no reason why the wards may not also share in these beneficences. Pretty rugs, large and small, can be disinfected and kept clean; window shades and drapings may be artistic, soft and pleasing; the beds may be in attractive patterns, pleasing polishes, and dainty colorings; and the bed dressings may be kept clean and neat. These things all enter into the therapy of our time, far more than drugs, plasters, and poultices.

May more hospital superintendents find the money to add their share to the new era of good taste and refinement in hospitals!—Hospital Management.

* * *

Who Said No More Sky Scrapers for Awhile?

No more skyscrapers are to be built during the war. The steel will be commandeered by the Government and used to construct ships. Two types of vessels will be turned out—destroyers, to hunt submarines, and merchantmen, built on a standard pattern, to carry food to the Allies. That President Wilson will act under the authority recently conferred upon him by Congress and divert every ounce of steel to Governmental shipbuilding was the statement made at the Navy Department last week.—Exchange.

(Notwithstanding the above, two contracts for steel frame buildings, involving about 500 tons of structural steel, were signed in San Francisco the past month. One contract was for a ten-story addition to the Newhall building and the other was for a seven story building for the Young Women's Christian Association.—Editor.)

"Oak and Its Uses"

By W. L. CLAFFEY

THE oak is the most majestic of forest trees. It has been represented as holding the same high rank among the plants of the temperate hemispheres that the lion does among the quadrupeds, and the eagle among birds; that is to say, it is the emblem of grandeur, strength and duration; of force that resists as a lion is of force that acts.—Loudon.

Oak is better known than any of our American hardwoods. Nature has given a peculiar favor to this very excellent and most substantial of all our American hardwoods. Quality, distinctiveness and durability are prime requisites; oak combines all three in the highest degree and places it in a class entirely by itself. It rightly merits the name "the king of lumber."

Oak trees are separated into fifty to sixty species in the United States. Botanists disagree among themselves as to the right number. Foresters and manufacturers of oak lumber divide all the oaks into two distinctive and commercial groups: the white oak (quercus alba) and the red oak (quercus rubra). The red oak requires two years to mature its acorns and the white oak but one year. The wood of the two groups is structurally different. In physical structure, the white oak is closer grained and harder than the red oak.

Woodworkers and lumber manufacturers usually determine the color of the wood before the log is cut up. It often happens that the color is decided upon by the bark, rather than by the wood itself.

While the oak is separated commercially into two colors, white and red, it is also segregated into quarter-sawed and plain sawed. The plain sawed stock is obtained by straight cutting and the quarter sawed is obtained by sawing logs into four quarters, then sawing boards at right angles to the annual rings of growth. This makes the beautiful flashy effect.

The oak tree ranges in height from 60 feet to 100 feet and in diameter one foot to six feet. The location of growth is from southern Maine to southwestern Quebec to central and southern Ontario, the lower peninsula of Michigan, southern Wisconsin and southern Minnesota and to southern Nebraska and southern Kansas and the southern States. At this writing there is more oak stumpage, meaning standing oak timber, in the state of Arkansas than in any one state in the United States. Of all the hardwoods, oak leads from the viewpoint of lumber production.

The wood of practically all the oaks is tough, strong, hard and heavy, with the characteristic plain and quartered figure, which has always made oak a standard cabinet, furniture, finish and flooring wood, in addition to its many other uses where strength and beauty of grain is essential.

Without regard to the many different species of oak, the manufacturing uses of oak are herewith summarized:

Manufacturing Uses of Oak

Purpose	Per Cent
Furniture and fixtures	32
Mill work	25
Car construction	15
Vehicles	11
Agricultural implements	3
Boxes and crates	3
Ship and boat building	2
Refrigerators and kitchen cabinets	2
Musical instruments	1
Sewing machines	1
Other uses	5
Total	100

If you are reading this article in your home, all you need do is look around the room and you will invariably find that your floors are oak, your living room table, desk, finish and picture frames oak also. If you have any knowledge whatever of the different varieties of woods, you will quickly recognize oak, which is usually left showing its natural, beautiful figure and color. For flooring purposes it is classified as America's best and finest flooring. It is the floor that the woman of today demands on account of its rich and cheerful color and the friendly atmosphere it creates. Then again, an oak floor requires less care than the so-called mahogany, that is birch mahoganized, or other hardwood flooring on the market. As an illustration, a birch mahoganized floor or furniture shows up every speck of dust and scratches, whereas the oak floor or furniture, due to its color, will not parade the dust or show the scratches. The writer of this article is using a mahogany desk on the sixteenth floor of an office building and this desk requires dusting at least two times a day. In the same office is a golden oak desk that does not show the dust and only requires dusting once in four days.

By right of superior merit oak when made into a finish, furniture or flooring, is preferable to other hardwoods. A home floored with oak flooring or finished in oak, commands a better selling price and better rentals, besides attracting a better class of tenants.

*
* *

Criticism of the New Architects' License Law in Idaho

COMMENTS by those who have read the new State Architects' License Law which recently became effective in Idaho, are, with few exceptions, most favorable to the provisions of the act which contains some 3,000 words. However, the following criticism would seem to be well taken by a writer who, while apparently pleased with the law as a whole, points to a few "unfortunate superfluities":

"A regrettable feature of this law is that every man in the State who called himself an architect before the law went into effect can demand a license. In effect the Board of Examiners has no discretion, but must issue to each a badge of competency, however poorly qualified he may be.

"This provision not only prolongs the time for raising the standard of education, but at one stroke holds before the public the most unworthy architects as a standard sufficient for registered or licensed architects. That means a low standard which cannot be eradicated from the public mind in generations. The respect of the public for the profession will be deserved if a reasonably high standard of character and competency is adopted at once. Incompetent men may continue to exercise any right they had when the law went into effect, but a registration law should not place a seal of approval upon them.

"One superfluous requirement of this law, which is a highly expensive and annoying nuisance, is that each architect must have a seal which is to be impressed on all drawings and specifications. Why not as well require physicians to seal every prescription?

"Section XIX of this law undertakes the task of defining the word 'architect' as one who designs or supervises buildings for others and to be constructed by persons other than himself, and proceeds by a peculiar definition of 'a building' to eliminate from architecture pergolas or park shelters, smokestacks or railway track sheds a mile long, simply because they do not

possess all of the three assumed essentials of a building, namely, 'foundation, walls and roof.'

"Civil engineers are not limited to practice under their own proper title, but are also required to call themselves architects if they design buildings. This will surely lead to jealousy and friction.

"It seems hardly fair or wise to prohibit engineers from doing buildings under their own title. If they *wish* to call themselves architects then they should be required to qualify on the artistic side of architecture. Instead of trying to force engineers who may have no artistic inclinations to qualify esthetically, it is better surely to encourage engineers and architects to co-operate. An architect and an engineer in partnership make an admirable team, for instance, to do factory or bridge work."

* * *

How to Build Houses to Retain Heat

WHEN a man builds a house in which he is likely to spend a half or more of his days, it is a matter of some little importance to him that it be built well—not merely that it be built so that it will not fall down, but so that it will leak neither water nor weather. A leaky house is a misery and a misfortune. It is almost sure to be a permanent liability, says a writer in the Heating and Ventilating Magazine.

In building, remember that no roofing is too good to cover your head. He who thinks to save money by using a cheap grade of shingles has much to learn at large cost. Shingles are not necessarily right because made of West Coast cedar, not because marked "Extra Star A Star." Before you buy shingles for your house, have the lumber merchant show you samples of all his stock. If he has a large variety, and something extra good, order the best he has.

There are other good roofs, some of them better than shingles, perhaps, but if you don't know how good they are, insist on seeing the material and on interviewing men who have used them before trying an experiment with them yourself. A leak in a roof is one of the most prolific causes of a chronic profane temper in the householder. A leak in the roof is worse than a rat in the walls, harder to locate and harder to be rid of.

There is also a science in the laying of roofs. Study that seriously before your roof is laid and see that it is laid scientifically. A careless or dishonest workman may make a bad roof of the best roofing material.

Next to water leaking through the roof, your worst elemental enemy is wind. Weather leaks through the siding and about the windows and doors are leaks in your purse. It is not an uncommon thing in any city for a householder to throw two tons of coal every winter through the cracks in his house.

Two tons of coal at $10 a ton is equal to the interest at five per cent on $400. Forty dollars added to the cost of material and labor put into the leaky house would have saved all this coal. When you are planning your house take a day off and look at all the varied kinds of felts and papers, fixtures and fabrics that are on display designed to "stop a leak to keep the wind away." Among them you will find something vastly superior to the old tar paper and back plaster, and something that will probably cost you no more money. Remember this, that builders these days know better how to build a weatherproof house than they did 20 years ago. Don't let any behind-the-times contractor build your house.

Here is something worth remembering. An attic floor with insulation is one of the best fuel savers ever devised.

If you buy a house already built assure yourself that its roof is waterproof and its walls weatherproof. Know that the man who built it is an honest builder. If ever you find yourself obligated to pay for a home with unmendable leaks in it the knowledge of the leaks will cut down your enjoyment of the home even more than the leak will drain your purse. Any construction that will save fuel is cheap, for fuel will be continuously dear. Two tons of coal a year will pay the premium on a snug little life insurance policy.

* * *

Will Wages Fall After the War?

THERE is a tendency to regard the present rates of "war wages" as being merely temporary rates that will recede to the former level shortly after the world war ends. Without doubt the prices of some materials, copper and steel, for example, will drop, but he is no student of wage rates who predicts a similar drop in wages.

Curves of wage rates have never followed curves of market prices, rising and falling with every tide of demand. Wages, it is true, have risen as a whole when prices as a whole have risen, and occasionally, but not always nor to so marked a degree, wages have receded as a whole when average prices have gone down. But wage earners are prone to cling stubbornly to every increase, and ultimately to maintain nearly all, if not all, of the increase. This has been notable in the industries where labor unions are powerful, but it has also been conspicuous in other industries. Increased wages of course can not be permanently maintained unless there is increased output of the workmen. But increased output is one of the things that high wages beget, and this comes about in two major ways: First, through the efforts of the employer and his managers to increase the efficiency of high-priced workmen. Second, through the efforts of the men themselves to "make good."

It has long been known that the higher priced workmen of the Pacific Coast were the most efficient workmen in America; but it was reserved for Mr. Henry Ford to show in a spectacular manner that a $5 minimum wage would serve to speed up shopworkers farther east to an unprecedented degree. There is a vast deal of "bunk" along with some truth in the common statement that "high wages breed inefficient workmen." For the most part, this is not true, and it is rarely true where the employer takes pains to arouse the workman's ambition and to cultivate his good will at the same time.

The workmen of Europe are receiving higher wages than ever before, and they are also delivering more units of product per man-day than ever before. They, too, will not go back to lower wage rates, for they, as well as their employers and their governments, have learned a lesson. This, in its turn, will assist in keeping up the wage rates in America.

Higher wage rates are here to stay, at least until they go still higher. He that defers construction until there shall be a marked fall in wages will never construct anything.

The conclusions to be drawn by managers of public and private enterprises, according to Engineering and Contracting, are these: Go ahead now with every project that will return an adequate saving or profit in normal times. Aim to secure minimum unit costs by careful design, by the use of labor-saving machinery and by vigorous driving of project to a finish. It is not overstating matters, we believe, to assert that if the best of present de-

signs were substituted for the present average design, fully 25 per cent of the cost of materials can be eliminated. This can be effected in some cases by substitution of one kind of material for another kind; but in most cases it can be effected by a better use of the materials now used. The average output of workmen is susceptible also of fully 25 per cent betterment merely through better management. But, in addition, the more extensive use of labor-saving machines and devices can be counted upon to secure a still greater reduction in unit costs.

For the moment, unit construction costs are relatively high, and some of them may long remain at the present level. Mere passivity, however, will not reduce them. High wages are here to stay. Whether lower unit costs are to be attained is distinctly "up to us"—the engineers and contractors. And we can not attain them by waiting. They are attainable only by the exercise of our wits. The time for that exercise is now. Engineers should encourage their clients and employers to go ahead with projects that would normally be put through.

* * *

Material Salesmen Valuable to Architects

TO KNOW that his architect subscriber considers the advertising pages of his architectural publication a vade mecum and a "compendium of useful knowledge" regarding all materials and appliances usable in his work may be very satisfactory to the publisher, but he is more satisfied when the advertisement prompts the architect to investigate the peculiar attributes of the advertised article so that he can apply it to that use most fitting to a particular design. It is not always possible to examine the material or appliance advertised in place or operation, or even on exhibition, but with a systematized business there is always time to converse with the intelligent salesman when he calls. Too few architects recognize the value of such interviews and their direct relation to the duty of giving the best service possible to the client. In this country, where the architect definitely specifies the material, and at whose dictum, rather than that of the paying owner, it is installed, this gathering of a detailed knowledge of materials is as important as the designing of stable construction. Even more so, because the contractor or superintendent can catch an apparent instability in plan while the material, once specified, only a superficial inspection of its quality and none of its comparative fitness to the particular purpose is probable after it is specified. Thus the granting of a thorough interview to a salesman is as much a part of the day's work as an inspection and checking up of the plans going through the drafting room. New materials and new methods are evolved daily and, just as rapid changes are taking place in design, a thorough knowledge of those materials most adaptable to the design is indispensable to the progressive architect. The advertising pages of his architectural journal furnish the information regarding the main qualities and purpose of a material, from which can be surmised its fitness to a particular purpose. The salesman gives the detailed information, and an inspection of the article itself decides the matter. The knowledge gained is in the direct interest of the client, and therefore has a direct influence on the reputation of the architect for capability in his community. The reputation of Dankmar Adler was based as much upon his intimate knowledge of materials and appliances as that of his genius for construction and he acquired much of this knowledge from the expert representatives of manufacturers of materials.—Western Architect.

Women in the Engineering Industries

("Women in the engineering industries" is a subject that is receiving far too little attention in the present national crisis. Below is an account of some of the marvelous things that British women are accomplishing to assist their government through the present troublous times. Serious thought should be given to this problem in these days of preparation.)

OUR British cousins are some two or three years ahead of American citizens in solving the problems of industry and engineering activity brought on by the great European conflict. The Electrical Review of London has recently discussed the question of women in the engineering industries which is abstracted below, that doubtless will prove interesting to engineers throughout the West:

The manner in which women have come to the assistance of the empire in taking the places of men of fighting age and fitness and in facilitating the most necessary work, must fill us all with admiration, but it is of the greatest possible importance that the movement, with its magnificent record should not stop where it is. There is need for the employment of female labor to be carried much farther than it has yet gone for the number of fighting men must be increased continuously until the enemy has been utterly defeated, yet the output of munitions for our men must be maintained at all costs. Of course, it is no new thing for women to be engaged in lamp-making, armature winding, accessories manufacture, and so on, but at a recent exhibition in England, there was brought together a collection of articles of many other kinds upon which women have brought their now proved adaptability and deft fingers to bear. Sparking plugs, complete magnetos, lamp-holders, armature parts, lighting switchboards for mechanical transport work and scientific instruments, are among the purely electrical examples upon which women have worked either at drilling or milling, winding, engraving, assembling and so forth. But the collection of photographs carries us into classes of labor where before the war female labor if not unknown in this country was almost a curiosity. They depict women engaged in a host of operations involved in general engineering, ship-building, and marine engineering, tool-room and precision work, small arms works, and the manufacture of parts of internal combustion engines. They show them engaged on wiring and rolling mills, operating all kinds of lathes and similar machinery, building small commutators, operating presses for armature work, assembling ironclad switchgear, erecting switchboards, driving 40-ton cranes, in charge of motors on industrial installations, driving electric trucks, electrically welding electric contact mines, operating a 500 kw. switchboard, and attending a 300 kw. direct coupled engine set and a 1000 h.p. steam engine.

Fear and suspicion on the part of male workers as to the position of certain classes of trades after the war, consequent upon the change, still lurk beneath an apparently calm surface; unwillingness and want of conviction as to the suitability of women for certain classes of work still mark the attitude of some employers; and many women continue to show a predilection for classes of service which normal times have proved to be their natural avocations. But we are governed today by the dictates of absolute necessity, and for the time being all will do well to pack up their prejudices, as the soldiers do their troubles, and find a way for doing their bit to further, in the interests of the great cause of Civilization, the employment of women in the engineering factories of the United Kingdom.

If the call of the war office is for men of fighting age and fitness, that of the ministry of munitions is for women, more women, and still more women for our factories in order that those fighting men may do their part with a minimum loss of life, and by hastening the end save millions of treasure also.

Our after-the-war problems may seem to be increased with each successive step forward in disorganization, but who can show suitable alternatives to present methods? Further, may it not well happen that instead of being detrimental to the national industrial situation that follows the war, the availability of a vastly larger volume of skilled and semi-skilled female labor will be an asset of immense value when we resume the manufacturing operations of pre-war times on what we hope will be an exceptional scale, calling for the co-operation of all the demobilized fighting men, and all the new industrial women, in the building up of greater industries than have ever been ours in the past?—Journal of Electricity.

* * *

What are Acoustics?

Closely questioned upon this point, many architects, if equally frank, might with the same truth make a reply similar to that credited to the eminent Mr. Richard M. Hunt, of New York, one of the greatest architects America has produced, in the following incident:

It was the custom of Mr. Hunt to make charcoal studies of interior details, full size, and for this purpose he had prepared in a room of the New York State Capitol, where he was engaged, a long wall space with a running board from which to work. On this particular morning Mr. Hunt, clad in a long linen duster to protect his clothes from the charcoal, was busily employed upon some details, when by some means entrance was obtained to his room without his knowledge, and the following dialogue ensued:

A Voice—"Is this Mr. Hunt?"

Mr. Hunt, continuing his work, without looking around—"Yes, I am Mr. Hunt. What can I do for you?"

The Voice—"Well, Mr. Hunt, what do you know about acoustics?"

Mr. Hunt, still absorbed in his work—"I guess I know as much as any one, and that's d—d little."

The Voice—"Well, Mr. Hunt, I think you are the man I am looking for. I wish to build a large church, and I am looking for an architect who will acknowledge he knows nothing about acoustics. My name is Henry Ward Beecher."—Construction.

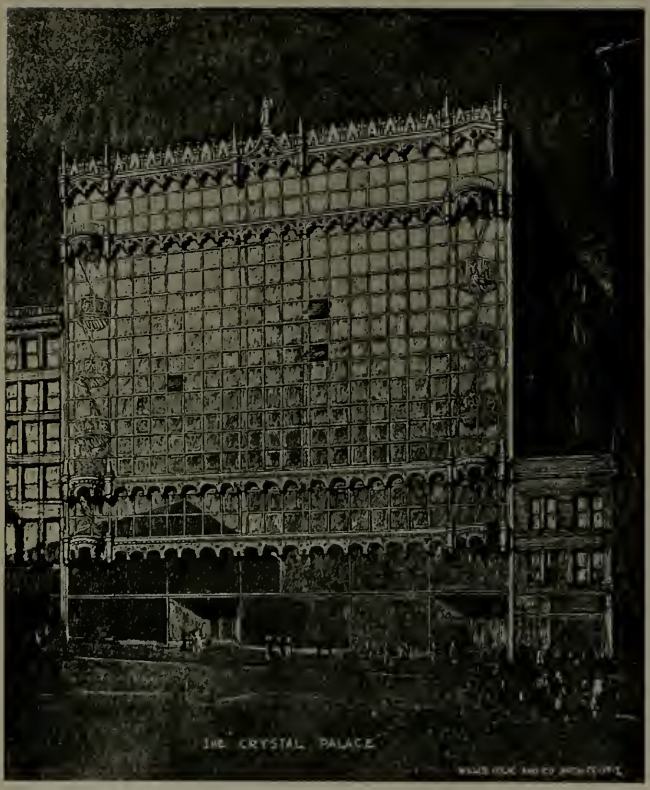
* * *

Unique Glass Front Building for San Francisco

MESSRS. WILLIS POLK & COMPANY have completed plans for a seven-story reinforced concrete commercial building to occupy the vacant lot adjoining the French Bank building on Sutter street, San Francisco. The structure will be unique from an architectural standpoint, the entire front being of glass. There will be about eighteen rows of reversible plate glass windows extending clear across the front, giving the facade the appearance of an eighteen-story building.

Architects the world over, ever since the invention of structural steel skeleton frames for buildings, have tried to give expression to this new form of construction. Paris, Vienna, Berlin, Buenos Ayres, New York and Chicago all contain examples of such efforts. However, it has remained for San Francisco to present an innovation. In this case the hard and fixed structural lines heretofore hampering free expression in design have been eliminated by the simple device of setting the columns back from the front about three feet or more. Thus the entire front can be of glass.

The tenants will be the Yawman & Erbe Manufacturing Co. of Rochester,



BUILDING FOR REGENTS OF THE UNIVERSITY OF CALIFORNIA
Willis Polk & Company, Architects

N. Y., and Robert S. Atkins of San Francisco. In order to acquire in this district this valuable ground floor space, these tenants have taken the entire seven floors. The upper floors will be sub-let. Construction will be completed the first part of the coming year.

*
* *

A Prospective Mortgage

"We deny ourselves much. I am saving to build a house."
"Is your wife cheerful about it?"
"Oh, yes. She thinks we are saving for an automobile."—The Lamb.

After The Architect

By C. B. J. SNYDER, F. A. I. A.*

BY this alliterative title I do not refer to those occasions after the erection of a new school building, when the dissatisfied schoolmasters get after the architect with a sharp stick, or mayhap a club. I should like, rather, to have your thoughts concerned for a few moments with what happens to the building after the architect turns it over to the school board completed and ready for use.

There is, aside from the actual labor involved, a real fascination for the architect in the planning and construction of almost any building, but in none more so than in a modern school building, for in no other type are the demands for light and air so exacting.

Then there are the various, and, maybe, changing kind of uses—science classes, housekeeping, dramatics, physical culture and many forms of industrial training—each with its own particular type of equipment—every provision being bound round with restrictions not only from the schoolmaster's point of view, but also as to financial limitations, rules and regulations of the state and municipality and others, which, with the necessity of making the buildings structurally sound and architecturally beautiful—or at least pleasing—altogether affords abundant opportunity for intellectual exercise.

The old world has long since accepted, as beyond argument, the principle that public buildings must serve not only the protective uses whose needs they supply, but they must also adorn the city. There is no class of building to which this quality more fittingly belongs than the schoolhouse.

Its occupants are in a plastic state. Whatever lessons of beauty the community is to teach by its parks and buildings, its monuments and its paintings, they are presumably productive of greater results if directed toward the child before its tastes have been blunted by the too prevalent ugliness of our average American city.

The requirement that the schoolhouse be a lesson in beauty, or at least good taste, is particularly strong in that it is a material possession of that department of the city which is concerned with the preservation and extension of culture and refinement.

More and more in America has the architect been permitted, and even encouraged, to perform this function; to design and construct buildings that are municipal lessons in good proportion, harmonious coloring, pleasing influence to the eye and mind and spirit of the beholder.

Further, the people have come to recognize that this provision applies with particular emphasis to the school building, as not only is the respect of the citizen for his municipality enhanced thereby, but the very purpose of the structure—the education of the children themselves—is greatly furthered.

There are numerous and well proven instances where there has been a remarkable increase in the efficiency of all the teaching—literary, mathematical, scientific and all other branches of work of a school—where the organization as a whole has been transferred from an old, out-of-date structure to one designed and equipped in accordance with latter-day ideas.

*Architect and Superintendent of Buildings for the Board of Education, New York City. A paper read before the Department of School Administration of the National Education Association in New York. Mr. Snyder has been architect of the New York Board of Education twenty-five years.

It reacts very strongly upon the personnel of both the teaching force and the pupils. We all know that there is a certain pleasure in doing even routine work in agreeable and convenient surroundings.

This has now become a recognized factor in the manufacturing world, where returns on the investment are far more carefully scrutinized and more easily measured in dollars and cents than is possible in public educational matters. For, with the maintenance of pleasing, even if not beautiful physical surroundings, there is a stimulation of the mental processes, a reduction in fatigue, and hence an improvement in the efficiency among the operatives that results in a very great increase in capacity or output.

The architect does delight in the fact that through the medium of stone and brick and other rough materials he may perhaps design a building that will be pleasing to the eye and prove adequate and convenient for its occupants. But in the mind of the man giving the best that is in him in the design of a modern school, there is also the hope that he is making easier, pleasanter and more effective the tremendously important work of education which is to be done in the buildings that come from his hand.

The architect, however, like the shipbuilder, launches his product and leaves it in other hands, and we have come to believe that unless the fundamental truths I have referred to are grasped and lived up to by those into whose care the buildings come, the whole doctrine of beauty and utility is lost.

The schoolmaster is in this respect a most important member of the community and should lead in the spirit of appreciation, and hence, preservation and improvement of not only the building and equipment, but in its external setting.

To those who have given thought and study to the spirit of protection thrown about the public buildings of Europe, there is the ever present hope that the civic spirit which prompts this, and of which we see certain evidences here and there, in our own country, shall quicken and expand so that it soon shall become a part of the every day education of the child.

There is nothing new, I am sorry to say, in the fact that in very many instances those responsible for a beautiful school building with adequate setting of shrubs and flowers, and who have relied upon civic pride of a neighborhood, to care for grass, hedges and flowering shrubs, have had their faith in human nature shattered and almost lost upon returning at some later date to find the building defaced, the flowers stripped, the shrubs destroyed and the grass worn down to the ugliness of a dog with the mange.

We have laid out open grounds with generous unobstructed space and have otherwise, as opportunity offered, provided for the development of civic pride only to find it necessary to enclose the premises with a high iron fence, as if it were a jail instead of a school.

In Italy, in France, in Germany and elsewhere, you will see open projects which it would be folly to attempt now in New York City. The school child of those countries does not think of destroying the shrubbery or of defacing the building, knowing as he does that should he do so, punishment swift and sure would inevitably fall upon him.

The preservation of school grounds and buildings is essentially the responsibility of the schoolmaster. He comes after the architect.

The advantages of order, symmetry and beauty are chiefly assets for his business.

We have school buildings which receive from their intelligent masters a care that not only makes them attractive and pleasant but is easily trans-

lated into dollars and cents, since it materially reduces the cost of maintenance. It pays.

It is a splendid provision of mind to see that the purpose for which a building was made pleasant and attractive is given an opportunity to function.

Teachers, pupils and the custodian observe from an intelligent and alert principal the pride and enjoyment that springs from the use of a beautiful building. Neatness and order in such use engender like qualities in the minds of all associated therewith.

Carelessness and lack of interest on the part of the principal as covering this particular matter is reflected in the minds and acts of the pupils. It thus becomes a damage to a community.

But a principal or schoolmaster who realizes why a school building was constructed and equipped with an eye to beauty and convenience, who appreciates that its mission cannot succeed unless he becomes its missionary, who maintains a well ordered, well cleaned, well preserved school building, such a one is, as he should be, an agent of civilization and refinement, a pleasure to assist and work with.

* * *

Reinforced Concrete*

By T. A. WATSON, C. E.

WHILE great savings can be made on retaining walls, it is generally not economical to employ reinforced concrete for the external walls of buildings, as brick walls up to a thickness of 14 in. are cheaper. As under the proposed London County Council Regulations nearly all external walls need not exceed 14 in. in a framed building, it is probable that reinforced concrete walls for this purpose will soon cease to be used from the point of view of economy.

With regard to the economy of reinforced concrete-framed buildings outside the London area the economy is considerable; inside the London area the London County Council, by their regulations, propose to reduce it as much as possible. There are, however, opportunities to effect savings over a steel-framed building even in London.

There is another factor which enters into the question of building operations of all kinds, and that is time, and I mention it in this connection because many people are of the opinion that the quickest form of construction is steel construction; and if drawings have been prepared a long time in advance so that the steel framework has been fabricated beforehand and is ready for delivery the moment it is required it may be that the steel frame is the quicker, but this is not always so; and starting from the same point, that is the time when working drawings of both reinforced concrete frame and steel frame are ready, generally some time after the foundations of the building have been started, it is possible in ordinary times to obtain steel bars in 14 days from that date, but it generally takes six weeks to obtain built-up stanchions, so that at the beginning reinforced concrete gets a four-weeks' start.

Again, in steel-frame buildings many architects use coke-breeze concrete or broken brick concrete between the R. S. J. fillers. Neither of these are water-tight; reinforced concrete 4:2:1 is practically so, and in a building constructed some years ago, seven stories high, I remember the plaster

*Abstract of a paper read before the Concrete Institute, London, Eng.

work was started on the ceilings of floors below the fourth before the seventh floor was finished, and as each of the remaining floors took about a fortnight to do, another month or six weeks was gained on the steel-framed building, as asphalt on the roof would have been necessary to prevent rain coming through the breeze or broken brick floors and spoiling the plaster.

It seems hardly necessary to mention that in the construction of bridges, say up to 300 ft. span at least, reinforced concrete is nearly always the most suitable material. There are of course exceptions, but the mere question of the cost of maintenance of a steel bridge seems to me enough to condemn it.

The question of maintenance is also enough to decide an architect or engineer to choose reinforced concrete for the construction of, say, small water towers, coal bunkers, gasometer tanks, or any similar structure heretofore built of steel, and exposed to atmospheric conditions, even if reinforced concrete is not cheaper in the first instance.

With regard to timber structures the same applies, and in addition the relatively greater resistance to destruction by fire makes the advantages of reinforced concrete so apparent that one wonders why timber is employed in the construction of wharfs at all.

But to turn to the other side, viz., economy in reinforced concrete, I would like to emphasize the point which in these strenuous days of competition seems to be overlooked, or rather ignored, and that is the enormous amount of waste which occurs through one of the methods adopted by architects to obtain cheap prices for the carrying out of work. An architect prepares the general design of a building and sends sunprints of same to four, five, or even six different firms of specialist designers, who in turn prepare each their reinforced concrete scheme and send out to five or six or even more contractors for prices, involving a total of some 30 or 40 persons, all of whom spend money and time in tendering, etc. Much valuable time is also wasted which might otherwise be spent in the construction of the building whilst the various prices and schemes are being compared and adjudicated on. This puts an initial charge on reinforced concrete which might be avoided if the architect or engineer would only choose his system, or employ a consulting engineer accustomed to the work to design the reinforced concrete work, and then send out for prices in the usual way.

One difficulty with centering is the amount of props required, and if this is left to the foreman in charge of the work it is very likely that the number put in is either too many or too few, and I would suggest to contractors, what has often been suggested before, that great economies might be effected by employing a competent man to design the formwork.

Another point which makes for economy in reinforced concrete, but has more to do with design, is the number of steel bars that have to be handled. It will be readily understood that it is just as easy to handle a 1⅜ in. diameter bar 25 ft. long as it is to handle one that is only 1 in. diameter, as the weight is immaterial.

Again in this connection I would point out that the 1⅜ in. diameter bars occupy less space in the width of a beam than the 1 in. diameter bars, and the labor cost on concrete may be reduced by 30 to 50 per cent by the employment of the larger diameter bar.

Again, with fewer bars there are fewer ends, and in many cases stirrups or shear members to fix, and the smith's work is correspondingly reduced.

The First Steel Frame Skyscraper

Editor The Architect and Engineer:

I WAS interested in your comments, in the May number of The Architect and Engineer, upon Professor Nolan's cogitations anent who invented the modern skyscraper.

It seems to be generally conceded that it was a necessity of the times, a natural and obvious step in the progress of building, and that no doubt many thought of the same solution of the problem at the same time. The Patent Office is full of coincident applications.

It is a fact that the first real skyscraper was built in Chicago by, I believe, Colonel Janney, the leading architect of that time—1889. How much before that actual construction did he or anyone else conceive the scheme, history saith not. But we do know that as far back as 1884 one of your editors, Mr. F. W. Fitzpatrick (formerly of Washington, now of Omaha, always an original and resourceful thinker) was chief draftsman in Buffington's office in Minneapolis and, with the assistance of a Swedish engineer named Strom, of the same office, designed an office building sixteen stories high, with castiron columns and iron beams as a structural frame, with brick curtain walls supported at every floor—essentially skyscraper construction. They startled the craft by writing about the thing and averring that they could build so up to twenty-five and even more stories. That particular building was not built that way. Neither the owners nor Mr. Buffington were quite sure enough of themselves or of Fitzpatrick to venture beyond the limits of masonry wall construction.

Some time later, Harvey Ellis, who succeeded Fitzpatrick at Buffington's, made a most beautiful water color of a twenty-five-story structure. People marveled at it, wagged their heads and chortled that it couldn't be done.

Still, many years later, Buffington startled the profession by suing architects and owners right and left for infringement of a patent he held on such steel frame construction! History saith not how he got it. But there were scores of tall buildings up and it seemed much as if he would gather in many simoleons. Law suits were started, great excitement was aroused, then things quieted down and soon nothing more was heard of Buffington or his alleged patents.

The point I want to get clear is that our friend Fitzpatrick, young as he was (twenty-one in 1883) was among the very first to think of the scheme and certainly was the very first to write about it and exploit it and be laughed at for being a dreamer.

Incidentally he has been the first to think of a lot of other things, in building and other lines, for which others have been given credit—after those things became assured successes.

Sincerely,

FRED W. LEPPER.

* * *

Damp-proofing Walls

For insulating stone buildings so that they will not absorb dampness from the surrounding ground, a new process has been introduced in Europe which, it is claimed, has proved successful. The method consists in sawing a slot in the foundation a few inches above the ground line and inserting in this lead plates coated with asphalt. To accomplish this a machine has been constructed which cuts a kerf about an inch in depth in the stone. After the plates are set in place temporary wooden forms are laid and liquid cement employed to close the crevices. This plan, it is said, prevents moisture from creeping up a wall, since it is unable to pass the insulation blocks.

RESIDENCE OF DR. GILBERT GRAHAM, PIEDMONT
Albert Farr, Architect

Failure of Poor Derrick Connection

A LARGE derrick mounted on the roof of a tall building in Portland, Ore., recently failed while hoisting the 67,000-lb. upper section of a steel smoke stack extension 10½ feet in diameter and dropped it 145 feet to the roof of a seven-story building. In describing the accident in the Engineering Record, Henry Black, engineer, Bureau of Buildings, Portland, Ore., said that a twisting moment on the derrick head produced by eccentricity of guy connections probably caused the failure. The derrick had a 106-foot boom of Douglas fir 14 inches in diameter at the tip and 22 inches at the bottom where it was connected to a 4⅛-inch vertical pin in an I-beam girder poorly connected to the 50-foot sill of an A-frame 45 feet high, made with two 14x14-inch timbers bolted at the top between two large steel plates. A heavy forging ran through the top connection plate and had an eye at each end. The one in front was shackled to the six-part boom topping lift tackle, the one in the rear being shackled to the back stay tackles anchored at the lower ends to the roof beams. A side guy was run from the rear shackle to a roof anchorage to provide for the reaction when the boom was swung transversely to lift the load from the street. The boom was designed to handle 30 tons at an elevation of 30 degrees.

When the accident occurred the boom was topped up to an angle of about 70 degrees with the horizontal, producing considerable twisting in the connection and tensile and eccentric stresses in the A-frame. One leg of the A-frame was broken just below its top connection, allowing the boom to fall and break just outside the fire wall of the building and permitting the derrick to slip backwards and turn over without, however, breaking any of the cable connections.

THE
Architect and Engineer
OF CALIFORNIA

Founded in 1905 by E. M. C. WHITNEY

A. I. WHITNEY - - - *Manager*
T. C. KIERULFF - - - *Legal Points*
FREDERICK W. JONES - - *Editor*

Published Monthly in the Interests of the Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast by the Architect and Engineer.

BUSINESS OFFICE AND EDITORIAL ROOMS
627-629 Foxcroft Building, San Francisco
Telephone Douglas 1828

The publishers disclaim any responsibility for statements made in the advertisements of this magazine

TERMS OF SUBSCRIPTION

(Including postage) to all parts of the United States $1.50 per annum; to Canada 50c additional; to all Foreign points $1 additional.

VOL. L. JULY, 1917 NO. 1.

ASSOCIATE EDITORS

WM. B. GESTER, - *Inspection and Tests*
O. P. SHELLEY, C. E. } *Fireproof Construction*
F. W. FITZPATRICK. }
W. W. BREITE, C. E. - *Structural Steel*
ATHOL MCBEAN } *Brick, Tile and Terra*
W. E. DENNISON } *Cotta*
HOWARD FROST. }
H. M. LOWENTHAL - *Roofs and Roofing*
FRED'K N. WOODS, JR., - *Rock and Gravel*
WILBUR DAVID COOK, *Landscape Architecture*
PAUL C. BUTTE - *Electrical Construction*
LOUIS G. MAUER - - *Waterproofing*
CHAS. H. CHENEY - } *City Planning and Book Reviews*
W. H. GEORGE - - *Reinforced Concrete*
T. R. BURKE - - *Sanitary Engineering*
J. W. FRICKE. . . . . *School Equipment*

ARCHITECTURAL

Alfred F. Rosenheim — Edward M. Garden
Fred H. Meyer — Irving F. Morrow
August G. Headman — F. D Hudson
Horace G. Simpson — Elmer Grey
G. Albert Lansburgh — Sumner P. Hunt
Houghton Sawyer — Ernest Coxhead
Herman Barth — Harrison Albright
Chas. S. Kaiser — John Parkinson
Chas. Peter Weeks — A. W. Smith
Octavius Morgan — William H. Weeks
J. C. Austin — Chas. W Dickey
John J. Donovan — Jas. W. Plachek
W. H. Ratcliff, Jr.

CONTRIBUTORS

Kenneth MacDonald, Jr. — W. Garden Mitchell
Wm. L. Woollett — Nathaniel Blaisdell
Wm. Arthur Newman — Willis Polk
Wm. C. Hayes — Smith O'Brien
John Bakewell, Jr. — C. H. White
Hon. Jas. D. Phelan — B. J. S. Cahill
Clarence R. Ward — T. Paterson Ross
John Galen Howard — Alfred Kuhn
Louis C. Mullgardt — John Reid, Jr.
Arthur Brown, Jr.

A "constant reader" wants to know why architects, as a rule, expect so much more of the roofer than any other mechanic on a building. Roofing is about the only material put into a house that the architect insists upon having guaranteed. He wants and expects the contractor to go good for the roof for a term of years. Does he exact the same guarantee from the plumber, the electrician and the painter? We think not. The architect knows that a leaky roof will do as much to injure his reputation as will a poor foundation. One is as important as the other. A leaky house is a misery and a misfortune and unless overcome it is a permanent liability. Roofing is a science. Everyone cannot lay a good roof nor can everyone make a good roofing material. This, despite a misguided impression that it is a good game to get into. How many have made a failure of it! One need make only a few inquiries to be convinced. The names of many roofing contractors that were in business two or three years ago are now conspicuous by their absence.

ROOFING GAME NEEDS AN UPLIFT

All of which prompts us to ask, is it not time to organize the roofing interests, not alone in San Francisco, but in every city of any size on the Pacific Coast? Each city should have its association—an organization composed of reliable contractors and roofing supply houses which should stand behind its members. An architect entering into a contract with a member of an association of this kind, can then rest assured that the job would be carried out according to specifications. With this guarantee of good work there would naturally follow a more liberal monetary allowance for the roofing contractor—an allowance sufficient to permit him to buy good material, pay for competent help and have something left for profit. Undoubtedly such an association would tend greatly to elevate the present unfortunate and unenviable standing of a great many of the roofing contractors, and it should also be the means of eliminat-

ing the irresponsible man who steps into the game today and is gone tomorrow. It seems to us that an association such as we have briefly outlined would benefit not alone the roofing contractors and supply men, but it would be money saved for the owner and a great deal of unnecessary worry and annoyance spared the architect.

DON'T LOSE YOUR HEAD

In every crowd there is always somebody who is ready to yell "fire!" Then the panic starts. When order is restored, everybody wonders why everybody else lost his head.

When President Wilson issued his war proclamation and called upon the people of the United States to conserve their resources for the struggle ahead, he did not mean that they should stop spending money. He did mean that useless expenditures should stop, but that was nothing new. Business consists of buying and selling. Certain kinds of business are fundamental. The building business is one of them.

There need be no curtailment in building or road construction. Let both public and private useful building construction proceed. Production and handling of building materials and public and private construction work are fundamental industries of the country. Any tendency to suspend or postpone building projects is inconsistent with maintaining our prosperity. The country is prosperous. Building investors should not hesitate to go ahead with their plans. Railroads should spare no effort to supply the building industry with the cars needed to transport materials. Government, state, county and municipal authorities should encourage the continuance of all kinds of building. Road and street improvements in particular should go on unabated. Bad roads and streets are factors of first importance in the present high cost of foodstuffs. Never before was the improvement of highways so essential.

The lumber, brick, cement, lime, sand, gravel, stone and other building materials industries are basic. Neither Government regulations nor railroad restrictions should be imposed unnecessarily to interfere with them. If any action is taken which results in the prostration of so fundamentally important industries, there is real danger of a surplus of unemployed labor, a surplus of railroad cars and a crippling of business that will seriously embarrass the Government in financing the war.

HIGH PRICES OF STRUCTURAL MATERIALS

The existing high prices of structural materials of all classes continue to be the principal factor that is now responsible for withholding a number of important operations from active construction. Although it is almost generally realized now that there can be no important recession in commodity prices for years to come, many prospective builders are holding out in the hopes that some circumstance will occur whereby material prices will be reduced to a level that will permit them to go ahead according to their original plans. In consideration of the high prices, owners who find it expedient to start their operations in spite of the prevailing prices, are cutting down their plans to the minimum and substituting, where possible, materials less costly than those originally specified.

There have been a number of such instances in San Francisco. Owners have ordered plans changed from a two or four story building to a single story store building. The scarcity of structural steel has impeded somewhat the construction of office buildings and theatres. The $500,000 theatre planned for upper Market street, San Francisco, by Messrs. Cunningham and Politeo, for example, has been temporarily abandoned. The owner was prepared to meet a considerable raise in the cost of structural steel but the manufacturers could offer no guarantee for immediate delivery.

Eighty Thousand Men to Build Army Cantonments

According to advices from Washington it will require from 60,000 to 80,000 men to build the sixteen great cantonments in which the new national army is to be assembled for preliminary training. These cantonments will comprise wooden buildings for sheltering the officers and soldiers, warehouses, mess houses, bath houses, shops, barns, garages, and offices. More than 400,000,000 feet of lumber will be required, according to estimates. Quantities of other materials to be used include 394 miles of insulated wire, 75,000 barrels of cement, 40,000 kegs of nails, and 30,000 shower bath heads.

Contracts for four of these cantonments have been let and contracts for the remainder will be awarded as soon as possible. No contractor will be allowed a profit of more than $250,000 and each contractor must meet all his own overhead expenses out of the percentage of profit which he is allowed.

Up to the present time only one cantonment site has been selected in Southern California, that at Linda Vista, near San Diego. For this cantonment, which will accommodate 30,000 soldiers, 200 buildings, containing 30,000,000 feet of lumber, will be required.

How Cost of Building Has Advanced

Mr. August Kehrberger, one of the best known Salem, Oregon, contractors, has some interesting figures to show the increase in cost of construction for the past four years. Among his other investments Mr. Kehrberger has built for himself a number of houses for renting purposes. Each two years he has added a new house, using the same plans. The house built in 1913 cost $1,800, that in 1915 $2,075, while the one built in 1917 cost $2,600.

American Institute of Architects

(ORGANIZED 1857)

OFFICERS FOR 1916-17

PRESIDENT.....JOHN LAWRENCE MAURAN, St. Louis
FIRST VICE-PRESIDENT.....C. GRANT LA FARGE, New York
SECOND VICE-PRESIDENT....W. R. B. WILLCOX, Seattle, Wash.
SECRETARY....W. STANLEY PARKER, Boston, Mass.
TREASURER.....D. EVERETT WAID, New York

San Francisco Chapter

PRESIDENT.....EDGAR A. MATHEWS
VICE-PRESIDENT.....SYLVAIN SCHNAITTACHER
SECRETARY AND TREASURER.....MORRIS BRUCE
TRUSTEES.....W. B. FAVILLE, G. A. WRIGHT

Southern California Chapter

PRESIDENT.....J. E. ALLISON
VICE-PRESIDENT.....J. J. BACKUS
SECRETARY.....A. R. WALKER
TREASURER.....AUGUST WACKERBARTH

Board of Directors

ROBT. D. FARQUHAR, PERCY A. EISEN, S. B. MARSTON

Portland, Ore., Chapter

PRESIDENT.....JOSEPH JACORBERGER
VICE-PRESIDENT.....J. A. FOUILHOUX
SECRETARY.....W. C. KNIGHTON
TREASURER.....FOLGER JOHNSON
TRUSTEES.....ION LEWIS, M. H. WHITEHOUSE

Washington State Chapter

PRESIDENT.....CHARLES H. BEBB, Seattle
1ST VICE-PRES....DANIEL R. HUNTINGTON, Seattle
2D VICE-PRESIDENT.....GEORGE GOVE, Tacoma
3D VICE-PRESIDENT.....L. L. RAND, Spokane
SECRETARY.....JOSEPH S. COTE, Seattle
TREASURER.....ELLSWORTH STOREY, Seattle
COUNCIL.....JAMES STEPHEN, Seattle; JAMES H. SCHACK, Seattle; CHARLES H. ALDEN, Seattle

California State Board of Architecture

NORTHERN DISTRICT.

PRESIDENT.....EDGAR A. MATHEWS
SECRETARY-TREASURER.....SYLVAIN SCHNAITTACHER

Members

JOHN BAKEWELL, JR. J. CATHER NEWSOM

SOUTHERN DISTRICT.

PRESIDENT.....JOHN P. KREMPEL
SECRETARY-TREASURER.....FRED H. ROEHRIG
MEMBERS.....OCTAVIUS MORGAN, SUMNER P. HUNT, WM. S. HEBBARD

San Francisco Architectural Club

OFFICERS FOR 1917

PRESIDENT.....CHAS. PETER WEEKS
VICE-PRESIDENT.....A. WILLIAMS
SECRETARY.....JOHN F. BRUTTLER
TREASURER.....WILLIAM HELM

San Fraurisco Society of Architects

For President.....George W. Kelham
For Vice-President.....John Reid, Jr.
For Secretary-Treasurer....Warren Charles Perry
For Director (1).....Charles Peter Weeks
For Director (2).....Arthur Brown, Jr.

Engineers and Architects Association of Los Angeles

PRESIDENT.....A. H. KOEBIG, SR.
FIRST VICE-PRESIDENT.....A. S. BENT
SECOND VICE-PRESIDENT.....IRA J. FRANCIS

Directors

J. J. BACKUS, GEO. P. ROBINSON, ALBERT C. MARTIN, H. L. SMITH

Washington State Society of Architects

PRESIDENT.....A. WARREN GOULD
SECRETARY.....WM. J. JONES
TREASURER.....J. L. MCCAULEY
TRUSTEES.....HARRY H. JAMES, WM. J. JONES, ALFRED BREITUNG, J. L. MCCAULEY, G. F. ROWE

San Diego Architectural Association

PRESIDENT.....CHARLES CRESSEY
VICE-PRESIDENT.....W. TEMPLETON JOHNSON
SECRETARY.....ROBT. HALLEY, JR.
TREASURER.....G. A. HAUSSEN

San Joaquin Valley Ass'n of Architects

PRESIDENT.....W. J. WRIGHT
VICE-PRESIDENT.....E. B. BROWN
SECRETARY-TREASURER.....FRANK V. MAYO

With the Architects

Building Reports and Personal Mention of Interest to the Profession

Personal

Mr. Louis C. Mullgardt returned on July 10 from a second trip to Honolulu, where he had plans approved for a splendid $60,000 residence and considerable other work. A number of charcoal drawings which Mr. Mullgardt made while in the Hawaiian Islands several months ago, have been presented by the architect to the city of San Francisco for the new Art Museum in Golden Gate Park.

Mr. W. L. Woollett, who is associated with Mr. A. C. Martin in designing a large theatre and office building in Los Angeles, is personally superintending the modeling work, which is being done at the Gladding, McBean plant, Lincoln, California.

Mr. T. Paterson Ross, formerly of the architectural firm of Ross & Burgren, 310 California street, San Francisco, is in the East investigating the latest ideas in mausoleum construction. Mr. Ross will visit Chicago, New York, Boston, and other cities, and upon his return will complete plans for a $200,000 granite, marble and concrete mausoleum to be built at Tropico.

Has Much Residence Work

Mr. John H. Thomas, First National Bank building, Berkeley, has awarded a contract for the construction of a two-story frame residence for Dr. Kuhn, at Cragmont. Work will cost approximately $3500.

Mr. Thomas has completed plans for a two-story and basement frame residence at Rockridge for Dr. Ergo A. Majors of Oakland. The estimated cost is $15,000.

Mr. Thomas is preparing plans for a frame residence to be erected on Spruce street, Berkeley, for Mr. W. J. Eardley.

Making Church Plans

Mr. H. W. Glidden, Wright & Callender building, Los Angeles, and Mr. George W. Wilson, Bakersfield, are preparing plans for a new edifice to be erected in Bakersfield for the First Congregational Church. It will be of hollow tile construction with terra cotta tile roof, Philippine mahogany interior trim, art glass windows, gas heating, and tile entrance.

Annual School House Number

The annual School House Number of The Architect and Engineer of California will be representative of the very best and latest in school building design on the Pacific Coast. Some fifteen different school houses will be illustrated and a number of working drawings and plans will be shown to add interest to the presentation. Only buildings erected within the past two years will be illustrated, the selections being made by a committee of competent architects. High schools, grade schools, open air and private schools will be shown. The text will be prepared by Mr. H. G. Simpson, whose writings on Domestic Architecture are familiar to readers of this magazine.

Architect of Many School Buildings

Mr. William H. Weeks of San Francisco, one of the best-known school house architects on the Pacific Coast, has recently been commissioned to prepare plans for a new high school building at Healdsburg. A bond issue of $100,000 has been voted by the citizens of Healdsburg. Mr. Weeks is also preparing plans for small schools at Esparto and Guinda in Yolo county. Plans for new lodge rooms for the Santa Cruz Elks are being prepared by Mr. Weeks, the improvements to cost about $20,000.

Little Work for Advisory Board

Last month it was announced that Messrs. Bliss, Mooser & Kelham, three San Francisco architects, had been appointed by the government as an Advisory Board in connection with the preparation of plans for Federal buildings on the Pacific Coast. According to a statement made by Mr. Bliss, who recently returned from Washington, there is little prospect of the board having anything to do unless the government is able to turn over to the members some of its emergency work. Congress dropped out all appropriations for Coast improvements when passing the recent budget, which means that there will be nothing done here for the present, unless it is of an emergency nature

Unique Marine View Home

Plans for one of the most unique buildings in San Francisco have been prepared for Mrs. Hetty Henshaw, who will build near the county line, on a site commanding a wonderful view of the ocean, a mission style combination residence, entertainment lodge and observatory.

The building will be two stories and will have a bell tower and a patio. The feature of the unique lodge will be a dining room and living room 25 by 37 feet, one entire side of which will consist of leaded glass windows looking out on the marine view. The approach will be through two mission entrance gates. The plans are by Mr. A. W. Pattiani.

San Jose Office Building

Twohy Brothers, of San Jose, have been awarded a contract for the construction of a two-story reinforced concrete office building at San Antonio and Market streets, San Jose, for the Prune & Apricot Growers' Association. The building will cover a ground area of 54x138 feet and will contain offices for about 120 officials of the association. Exterior will be of white cement. The building will have a steam heating plant with oil burner and will cost approximately $25,000. Plans were prepared by Messrs. Binder & Curtis.

Alameda Has Planning Commission

Alameda's new city planning commission met for the first time the past month and perfected an organization. Mr. A. F. Heuter was elected president and Mrs. Ethel E. Stein secretary. Mr. Charles H. Cheney, San Francisco architect identified with city planning work, appeared before the commission with drawings and plans of a scheme soon to be put into effect in Fresno.

Contract for Extension to Mess Hall

The United States Government has awarded a contract to Mr. Wm. Knowles, Hearst building, San Francisco, for the erection of a two-story and basement frame and concrete extension to a mess hall for the United States Naval Hospital at Mare Island. The work will cost $14,000.

Houghton Company Given $600,000 Contract

The Houghton Construction Company, Hooker & Lent building, San Francisco, has been awarded a contract by the Southern Pacific Company to build a line of reinforced concrete snow sheds at Rock river, Wyoming. The work will involve an expenditure of close to $600,000. The unit system of construction will be used.

Ten-Story Class "A" Addition

Mr. Lewis P. Hobart, Crocker building, San Francisco, has been commissioned to prepare plans for a ten-story Class "A" addition to the Newhall building at California and Battery streets, San Francisco. The contract for the structural steel, amounting to about two hundred tons, already has been let to Dyer Bros. Construction will be of steel, concrete and brick and terra cotta and the same architectural lines of the present building will be followed. The improvements will cost approximately $125,000.

Cupertino High School

Messrs. Allison & Allison of Los Angeles have been commissioned to prepare plans for a $40,000 union high school at Cupertino, near San Jose. A bond election will be held this month to vote $50,000, one fifth of which will be spent for the purchase of a site. There will be ten class rooms and an assembly hall. Construction will be frame. Several San Jose architects had been given to understand that there would be a competition and they expressed surprise when it was made public that the board had already decided upon its architects.

Newspaper Plant

Mr. Frank D. Wolfe, Auzerais building, San Jose, has prepared plans for the reconstruction of the Mercury-Herald building on Santa Clara street, San Jose, recently damaged by fire. The present walls will remain, but the entire interior will be rebuilt. There will be tile and cement interior finish, concrete roof, new elevator, heating, plumbing and electric work.

Four-Story Building

The Robert Dalzeil Company, of 556 Mission street, San Francisco, has had plans prepared by Mr. A. L. Milwain for a four-story mill construction loft building at Mission street and Shaw alley. The building will cover an area of 76 by 160 feet and will cost $70,000. It will have a pressed brick exterior, two elevators and gravity chutes.

$25,000 Class C Garage

Messrs. Heiman & Schwartz of 212 Stockton street, San Francisco, have prepared plans for a two-story Class C garage and supply house to be erected on the northeast corner of Pine and Franklin streets for Mr. L. A. Meyers. The building is to cost $25,000.

Oakland Garage

Plans have been completed by Mr. John R. Miller, Lick building, San Francisco, for a one-story reinforced concrete garage to be erected at 28th street and Broadway, Oakland. Building will be 40x100 feet, and will cost $7500.

San Francisco Leads in Building

Figures compiled by the San Francisco Chamber of Commerce as to building operations for the month of May, 1917, show that San Francisco leads the Pacific Coast by a wide margin. The amount of construction work for May of this year, as compared with the same month last year, shows a gain of $1,306,737. Following are the figures for the six leading Coast cities:

	1917	1916
San Francisco	$2,938,657	$1,631,920
Los Angeles	782,651	1,379,691
Seattle	1,104,070	504,365
Portland	377,245	470,130
Oakland	465,430	414,407
San Diego	63,125	302,310

Preliminary Plans for Estuary Bridge

Mr. P. A. Haviland, C. E., of Oakland, collaborating with the engineering department of the Southern Pacific Company, has completed preliminary plans for the Alameda estuary bridge, the cost of which is to be shared by the cities of Oakland and Alameda, the county of Alameda and the railroad company. The bridge is to cost $1,500,000. It will take several months to complete the plans. Bridge is to be of the bascule type and will rest on concrete piers with steel superstructure.

Church Plans Completed

Mr. Chas. A. Haber, of San Francisco, has completed plans for a three-story Class "C" social quarters building to be erected on Bush street, near Taylor, San Francisco, at a cost of $60,000. The owner is the Fitzgerald Memorial M. E. Church, South.

Oakland Branch Libraries

Plans for three branch libraries for the city of Oakland have been completed by Messrs. Dickey & Donovan of that city. Bids for all of them shortly will be advertised. Each building will cost approximately $31,000, but all will be of a different type of architecture.

Store Alterations

Plans have been completed by Mr. B. J. Joseph, Call-Post building, San Francisco, for extensive alterations to the Philadelphia Shoe Store and Marks Bros.' store on Market street. Upwards of $20,000 will be expended on the work.

Memorial Hospital

Plans are being completed by Messrs. Ward & Blohme of San Francisco for a two-story frame and stucco hospital to be known as the Rideout Memorial Hospital at Marysville. There will be about thirty rooms. Equipment will be modern in every respect.

Medals for Architectural Work

To stimulate better work on the part of Los Angeles architects and to create a greater interest and appreciation of architecture upon the part of the general public, the Southern California Chapter of the American Institute of Architects has decided to inaugurate the custom of conferring medals upon the architects executing the most meritorious work each year. There are to be three medals, one to be awarded for residence work costing between $2000 and $10,000, one for residence work costing over $10,000, and the third for architectural work other than residence work. The work for which the medals are to be awarded is to be selected by a jury.

Builds House in Eight Hours

The erection of a rustic bungalow at Neptune beach, Alameda, in eight hours, was accomplished recently by Contractor A. T. Spence and a force of eighteen workmen. Mr. Spence succeeded in completing the work on schedule time and the result was a very creditable-appearing little home. The feature was planned by the Oakland Realty Board and is said to have been the most novel of its kind ever schemed. Furnishings for the house with all the little details, even to a sweet-voiced canary-bird, were installed in the allotted time. The bungalow was designed by Mr. Edwin J. Symmes, architect, of San Francisco.

Big Warehouse for Sacramento

The Northern Electric Railway Company has had plans prepared for an immense wharf and warehouse and construction will probably start before the end of the month. The warehouse will be 100x400 feet, and will be located on the river bank at the foot of "M" street. Part of the structure will be leased to a warehouse company.

Fresno Bank Building

Plans have been completed and figures taken for the construction of an eight-story Class "A" bank and office building in Fresno, for the Bank of Italy. Construction will be Class "A" with steel frame, concrete walls and floors, hollow tile partitions, and exterior of pressed brick and terra cotta. Mr. R. F. Felchin of Fresno is the architect.

Hotel at Roosevelt, Arizona

Mr. C. K. Bonestell, Jr., and Chas. A. Haber, associate, with offices in the Monadnock building, San Francisco, have completed plans for a two-story Class "C" hotel to be erected at Roosevelt, Arizona, for the Southern Pacific Company. Construction is to be of native stone, with terra cotta tile roof. The building will cost $60,000.

New Hotel for Calistoga

Mr. James W. Plachek, of Berkeley, has prepared plans for a two-story frame summer resort hotel at Calistoga for the Myrtle Dale Springs Company. A feature will be carrying the hot water from the spring through pipes to the radiators throughout the building, this plan being devised by way of economy instead of installing a regular steam heating plant.

Residence Apartments

Messrs. Willis Polk & Company of San Francisco have drawn plans for four two-story Class "C" apartment houses to be built on Mason street, near California, San Francisco, for Mr. John W. Proctor. The buildings have been designed for rental to large families, each being a residence in itself with from eight to ten rooms, three baths and separate garages.

Southern Pacific Work

The Southern Pacific Company, Engineering Department, has completed plans for new depots at Selma and Gilroy. Bids for the construction of the former have been taken. The company is also having plans made for a large warehouse at South Vallejo Terminal. It will also enlarge its Mare Island warehouse.

Reinforced Concrete Garage

Mr. F. D. Voorhees, Central Bank building, Oakland, has prepared plans for a one-story and basement reinforced concrete garage and store room to be erected at 23d street and Broadway, Oakland, for Mandell Goldwater. Contracts for the work already have been let.

Dissolve Partnership

The firm of Eisen & Son, architects, Los Angeles, has been dissolved by mutual consent. Messrs. Theo. A. Eisen and Percy A. Eisen will each continue the practice of architecture on his individual account, the offices remaining at the present location in the Wilcox building.

Addition to Sacramento Post Office

Plans are being prepared in the office of Mr. J. W. Roberts, Post Office building, San Francisco, for an addition to the Sacramento Post Office building. The attic will be carried up a full floor, giving some much-needed additional office room.

Designing Numerous Cottages

Mr. Fay M. Spangler, who recently moved from San Francisco to Eureka, is preparing plans for a number of one and two-story frame cottages to cost from $3000 to $5000 each and to be erected in Eureka for Mr. Ogden Smith.

Site for Hospital

With each side holding in reserve five valuation experts, the County of Alameda and the Berkeley Baptist Divinity School has commenced preliminary maneuvers in Superior Judge Wells' court in a suit brought by the county to condemn the California College site at Fourteenth avenue and Vallecito place for the new county hospital. The site was offered to the Board of Supervisors for $45,000, quoted as the rock-bottom price. The county seeks to condemn for not more than $30,000, based on alleged assessments on the property.

Bronze Statue of S. J. Tilden

Mr. William Ordway Partridge, sculptor and brother of Bishop Sidney Catlin Partridge of Kansas City, recently was notified by the Art Commission of New York that his design for the bronze statue of the late Samuel J. Tilden, one time candidate for governor of New York and leader in Democratic politics, had been accepted. The statue will be placed on a granite base in Thirty-fourth street at Park avenue. Mr. Partridge, who has made statues of many prominent men, is in San Francisco studying the work of California sculptors and painters.

Pig 'n Whistle's New Store

Mr. A. S. Heinman of Los Angeles is preparing plans for larger quarters on Powell street, near Market, San Francisco, for the Pig 'n Whistle. Additional room has been leased and the firm will occupy three floors. A feature will be an art glass dome studded with lights which will illuminate all three floors. The finish is to be in curly birch. The management will spend $100,000 on the improvements.

Modesto High School

Revised plans have been completed by Messrs. DeRemer & Hewett of Los Angeles for the Modesto High school. Construction will be hollow tile walls with stucco finish and clay tile roof. There is $135,000 available for the improvements.

Architect for Apartment House

Mr. A. S. Heide, 367 Russ building, San Francisco, is the architect for the four-story and basement brick apartment house to be erected at Clay and Laurel streets, San Francisco, for Mr. James L. McLaughlin. The building will cost $60,000.

Hospital Plans Completed

Mr. Alfred I. Coffey, Humboldt Bank building, San Francisco, has plans complete for a four-story and basement Class "A" addition to the St. Francis Hospital at Bush and Hyde streets, San Francisco.

Electrical Department

Banking Institutions "Doing It Electrically"*

By F. D. WEBER.

(Artistic and efficient lighting of the great banking institutions in the West has proved a problem intricate in design for the electrical engineer. The marked success not only attained in bringing about the combination of these two qualities, but in completely equipping a banking institution electrically, is exemplified in the recently completed First National Bank building in Portland, Oregon; A. E. Doyle, architect.)

First National Bank Building Portland, Flood-lighted

THAT probably is recognized as the most pretentious and elegant bank building on the Pacific Coast has just been completed on a quarter block of land at the southwest corner of Fifth and Stark streets, Portland, Ore., by the First National Bank.

Work was commenced in April, 1915, and the bank occupied it on November 20, 1916, after nineteen months of construction work.

The exterior of the building, as designed by Coolidge & Shattuck, Boston architects, is patterned after the Athenian Parthenon, the Grecian masterpiece. Even the decorations carved in the Colorado Yule marble, which forms the exterior, are of Grecian design, and the figures which hold up a copy of the old territorial seal of the State of Oregon are Greek forms. The entrance passageways themselves are small reproductions of Greek temples, the design differing to that extent from the Parthenon in Athens.

The interior of the building embraces substantially 40,000 square feet of floor space, including the basement, where the heating plant, the locker rooms and the safety deposit vaults are located. The savings and trust departments are located on the first floor and the main banking room on the second floor, which is approached by a wide stairway. From the second or main floor, tall sogliola (or imitation marble) columns, said to be the largest in the country, stretch to the ceiling and skylights above the mezzanine and top floors. These columns serve three floors. The mezzanine floor is given over to working space for the clerks and bookkeepers and the top floor is divided into rest rooms for the women and men employes and into storage rooms. Elevators serve both sides of the building.

The interior has been finished for the most part in Botticino (Italian) marble. The gray marble used in the floors came from Knoxville, Tenn. The office furniture used is mahogany. The decorative scheme of the interior is pure Greek, the designs having been marked out under the supervision of Pennell, Gibbs & Quiring of Boston.

The electric fixtures carry the decorative scheme out, even as regards coloring in both the fixture and glassware. This is the first installation of this character attempted in the Northwest.

The electric fixtures combine the indirect and direct methods.

The unique part of this installation is the volume of electric equipment installed in a bank building where not very much is to be ordinarily expected. In this building the following equipment is installed: All the outlets except base plugs are on separate circuits. All wire and cable are 30 per cent Standard underground cable, consisting of about 20,000 feet feeder. There are sub-feeder cables to the extent of 60,000 feet of duplex circuit wire. All sheraduct conduit and fittings. The main service switch is a 2,000-ampere oil break switch, and the main service cables consist of three 1,000,000 cir mil cables. There are five automatic coin elevators and four passenger elevators. The installation required twenty-one motors of 120 h.p. The total number of lighting circuits is 250. Besides this equipment, ample floor outlets are installed for future connections.

Empty conduit is installed completely encircling each floor, for installation of future wiring of any kind that may be required. Conduit is also installed across the spaces,

* Reprint and illustrations courtesy of Journal of Electricity.

so that in event of running the future circuits, the floor or walls will not have to be torn up.

Practically all lights are controlled by wall switches, three and four way control being used extensively for convenience of control and economy of current.

Provision has been made for the flood-lighting of the building from across the street. For this purpose 6-500 watt close range lights have been erected on top of a building across the street.

One four and one ten point Bryant "Silent Call" signaling system for officers, is installed.

The building owns all the conduit in which the Pacific Telephone & Telegraph Company and the Home Telephone Company have their service installed inside this building. This was installed by the electrical contractor during the construction period. There are 56 telephones in use.

The three main fixtures, with 6 circuit capacity each, are controlled from the second floor through Cutler-Hammer solenoid switches.

All the motors are remotely controlled, by Cutler-Hammer remote control apparatus, from a point in the basement in the boiler room with a pilot light signal on each.

A 5 h.p. stationary Blaisdell vacuum cleaner system is installed in the basement.

All of the electric cabinets have brass fronts—bronzed. The panel boards are white Italian marble. They were manufactured by the Western Electric Works, Portland, Oregon. The vaults are protected by the A. D. T. Co.'s burglar alarm and it, together with all other signal systems, are in conduit.

All rheostats and control apparatus throughout the building are installed in ventilated iron cabinets. Great Western re-

Main Banking Floor, showing Artistic Features in Lighting Fixtures

Wybro

Reg. U. S. Pat. Office

Veneered Panels that ARE good—order today from

Why we Guarantee Wybro Panels

The reason we so unhesitatingly guarantee the WYBRO PANELS is because we have yet to see their equal in point of **quality** and smoothness.

We have yet to see a better made panel at **any price**—a panel that will look as well and last as long as the WYBRO.

That is why we give the broadest kind of a guarantee on WYBRO PANELS.

White Brothers 5th and Brannan Sts. San Francisco

Interior of Bank, Electrically Lighted

fillable fuses are used throughout as a regular maintenance man will be in charge.

One of the features of the interior is a large wall clock located at the west end of the banking room facing the entrance. Besides this one there are two others, and they are all operated from a duplicate storage battery of 12 cells at 24 volts. Howard clocks are used.

It is so inspiring to know that it was the intention to have this building the best "wired" building of its type in the country, and no expense was spared to make the electrical installation complete, and to provide for all future developments in the electrical line.

The specific equipment is as follows:

LIGHTING	POWER	
22 cirs. in basement, west side.	1-5 h. p. on exhaust (foul air).	2-5 h. p. pumps for boiler feed.
22 cirs. in basement, east side.	1-5 h. p. on air washer.	2-5 h. p. fans circulating air.
60 cirs. in first floor.	1-7½ h. p. on fan fresh air.	2-5 h. p. air washers.
52 cirs. in second floor.	2-5 h. p. on sump pumps.	1-2 h. p. exhaust fan.
36 cirs. third floor.	1-5 h. p. on exhaust fan.	3-8 h. p. elevators.
28 cirs. in fourth floor.	1-½ h. p. air compressor.	5-½ h. p. coin elevators.
24 cirs. in attic.	1-5 h. p. vacuum cleaner.	47 adding machine motors.
6-500 watt flood-lights.		

An Electrically Equipped Bungalow

An electrically equipped bungalow has been built and furnished by an enterprising concern in Minneapolis, Minn., for the purpose of demonstrating in actual use a line of electrical household conveniences. In the dining room is a complete line of electric toasters, percolators, chafing dishes, grills, etc.

The kitchen is equipped with an electric range, electrical fireless cooker, combination electrical dish washer and drier and electric coffee grinder, and an electrical polishing, sharpening and utility motor.

The bedroom is equipped with heating pads and an electric blanket. On the dresser is found a milk warmer for the baby. The dressing table is equipped with massage vibrator, hair drier, and curling iron.

The electrical bathroom appliances shown are disc stoves and immersion heaters for heating water and other liquids and electric shaving mug and massage machine.

The laundry room displays a washing machine and ironing machine, as well as an automatic electric ironing board. An electrical clothes drier completes the laundry.

In every room are placed wall outlets for convenience of attaching electric fans, and also baseboard receptacles upon which can be attached a vacuum cleaner.

California Has Nine Hundred Miles of Concrete Highway

So far California has about nine hundred miles of concrete highway. The chief of road economics of the United States Office of Public Roads, recently writing from California, said:

"I have just returned from a thousand-mile tour of California highways, more than six hundred miles of which traversed the state system of trunk lines. With due regard for the great work already completed and under way in the Eastern States, I predict that the California highway system now in the making will be, when completed, the most notable system of highways in America, if not in the world."

The Governor of California quoted this testimony in his biennial message to the California Legislature on January 8 of this year in reviewing the achievements of the California State Highway Commission under the administration of Chief Engineer A. B. Fletcher.

CONTRACTOR AND BUILDER

Some Phases of General Contracting

By STOCKTON B. COLT

GENERAL contractors submitting estimates for the entire work of erecting a building obtain competitive estimates on the various parts of the work from various sub-contractors, either preferred or approved as the case may be, the aggregate of which sub-estimates, together with certain other estimates furnished by the general contractor, plus the total profits to the general contractor, forms the general contractor's estimate for the entire work. It appears very often that general contractors are also masons and carpenters, or both; accordingly, they do not obtain competitive estimates on these items of the work. For example, the schedule of charges usually required by the architect from the general contractor upon the signing of the contract sets forth the various parts of the work sub-contracted for and their prices plus their commission to the general contractor. The amount of the work sublet is in the neighborhood of say 70 per cent of the entire work, and the balance, or 30 per cent, is that part of the work furnished direct by the general contractors without competition.

If it is desirable to engage a general contractor to supervise the entire work and see to the proper building sequence of the various trades so that all work shall fit and agree and be carried forward harmoniously, efficiently and with dispatch, then why not have him in a professional capacity of supervisor only, with adequate remuneration for his valuable services as such, and have competitive estimates on all the items entering into the make-up of the building, including the mason work, carpenter work, and the like? Each sub-contract could be made directly between the sub-contractor and the owner, the requisitions for payment on the various sub-contracts might come through the general contractor in the form of a certificate, which to become valid for payment would have to be countersigned by the architect. Such a plan might combine the desirability of a general contract plan and the plan of sub-letting every part of the work directly from the architect's office. Sub-letting directly from the architect's office is theoretically economical, as it eliminates the percentage of profit to the general contractor on these sub-estimates, but it must be borne in mind that the building business is a science in itself requiring long practice and experience, and few are the architects' offices so equipped as to perform this function advantageously.

Steps in the direction of sub-letting have been made for some time in segregating from the general contract many items, such as heating and ventilation, plumbing, electric wiring, elevators, etc., leaving the balance of the work to be cared for by a general contract, and thus obtain that flux which is necessary to proper building procedure, but under this plan these parts segregated from the general contract and sub-let directly by the architect are usually the very works which the general contractor alleges are the causes of all delays and difficulties which may arise in his own work.

The question is, why should not the general contractor sub-let everything on a competitive basis and not personally enter the field for any part of the trade, such as mason work or carpenter work in connection with the entire work which is to be intrusted to his supervision? If the general contractor sub-lets every portion of the work he should be raised to a purely professional sphere and would not have to hold the double function of a purely professional service and a commercial one as being a direct contractor for any part of the entire work.—New Jersey State Journal of Architecture.

Percentage System in Building Work

By G. D. CRAIN, JR., in The National Builder.

THE extent to which the percentage system of handling building contracts is being used, especially on smaller jobs, such as residences, is indicated by the fact that one of the leading building concerns of a southern city reports that over 90 per cent of its work is now being done on that basis.

An interesting discussion of the merits of the plan is contained in a letter sent out by the company to its customers, in which the following language appears:

> We all agree that what the average person wants when making a purchase is to get his money's worth. He is willing that the seller should have a legitimate profit over and above his cost of material and labor and expense of conducting business. We want you to get acquainted with our method of building.
>
> Building, like other lines, has undergone changes in recent years. Formerly competition was so keen that many builders, in order to get work, simply neglected the matter of overhead, and undertook work that caused them losses, and then wondered why they made no better progress. We have gotten away from that and are following largely the cost-plus-percentage method to the satisfaction of a large number of our clients. The

LIGHT — POWER — TELEPHONE INSTALLATIONS

STANDARD ELECTRICAL CONSTRUCTION CO.

MANUFACTURERS OF

SWITCHBOARDS AND PANEL BOARDS

Contractors and Engineers

60 NATOMA STREET, SAN FRANCISCO, CAL.

Phone Sutter 894

WE USE EXCLUSIVELY "TRUMBULL"

PLAINVILLE SWITCHES

HIGH GRADE

ELECTRICAL CONSTRUCTION WORK

FOR BUILDINGS

BUTTE ENGINEERING AND ELECTRIC CO., 683-87 Howard Street,

SAN FRANCISCO, CAL.

PACIFIC FIRE EXTINGUISHER CO.

ENGINEERS AND CONTRACTORS

Heating and Ventilating, Electrical Installations, Fire Extinguishing Apparatus

THE GRINNELL AUTOMATIC SPRINKLER

Main Office: 507 MONTGOMERY STREET, SAN FRANCISCO, CAL.

Branch Offices:
217-218 Colman Building - - - - - - - - - Seattle, Wash.
504-505 McKay Building - - - - - - - - - Portland, Ore.
826 Paulsen Building - - - - - - - - - - Spokane, Wash.
563 I. W. Hellman Building - - - - - - - Los Angeles, Cal.

IS LIGHTING YOUR AIM?

or, is it an indiscriminate selection of fixtures to aggregate a fixed sum?

Modern electrical science has increased the efficiency and decreased the cost of lighting. Our experts, without cost, will show you how to secure best results at the smallest possible expense. Incidentally, we can offer you the largest and most up-to-date stock of lighting fixtures on the Pacific Coast from which you can make your selection.

OUR PRICES ARE RIGHT.

ROBERTS MANUFACTURING CO.

Designers and Makers of LIGHTING FIXTURES 663 Mission St., SAN FRANCISCO

fact of the matter is that at present over 90 per cent of our large volume of work is being done on this plan.

By this method we guarantee our figures and you have the advantage in the first place of knowing the maximum amount that you will have to invest, and then of enjoying the anticipation of a possible saving, as in nearly every case we have effected one, ranging all the way from 5 to 20 per cent.

The system, as indicated, involves taking the work on a basis of the cost-plus-percentage, which includes overhead, supervision and profit. The amount of the margin varies, but 15 per cent is about the average at which most jobs of this kind are handled. The maximum figure which is named on the job is usually the architect's estimate; and while one possible advantage of the percentage system, from the standpoint of the builder, is that he is protected in case of unusually expensive features unexpectedly developing, the company above referred to has found that the estimate is ordinarily sufficiently liberal to enable it to be used as a maximum basis on which to figure the work.

The defects of the system of competitive bidding are obvious. The man who knows least about the cost of doing the work is often the successful bidder—for this reason. The percentage system enables the owner to discriminate and to select the concern which has earned a reputation for good work and reliability, as he is then protected from excessive costs by the arrangement described. In other words, a premium is put on good work, rather than merely on the ability to bid low.

The average owner is willing that the contractor make a fair profit on his work; and it is also plain that if a contractor sees that he is likely to lose money on a job he will be tempted to "cut the corners" wherever he can for the sake of making his net loss as low as possible. This does not always happen, of course; for many concerns would rather lose money on a piece of work than risk losing the good-will of the customer. Nevertheless, the temptation to slight the quality, when it is found that a bid which is too low to cover the cost has been made, is present, and it doubtless has its effect in a good many cases.

On the other hand, the very fact that the wise contractor appreciates the risk involved in bidding, since it is never possible to anticipate every feature which may arise, means that a larger margin must be allowed to take care of the unknown quantities than would be necessary if every point were covered by the bid. The contractor who would be willing to make 15 per cent "for sure" on every job will probably allow 25 per cent in bidding in order to take care of the unexpected difficulties that may arise, and also to take care of other jobs where the net had been considerably below the expected profit.

THESE houses and thousands of others have been preserved by the Bay Stater. He puts a coat or two of "Bay State" on the house and it's *safe* and *sound*. Rain, sleet, sun and all the rest have no effect on it.

This famous coating comes in white and a variety of tints. It's sure cure for worn walls of brick, cement or stucco.

Write us. We'll send you Booklet No. 15 full of photos, facts and figures. Also a free sample of any tint you want.

Bay State Cement Crack-Filler is the first-aid treatment for walls that crack. It is easily applied and not detectable.

WADSWORTH, HOWLAND & CO.
Incorporated
Paint and Varnish Makers
Boston, Mass. New York Office Architects' Bldg.

BAY STATE
Brick and Cement Coating

To Be "Low Bidder" Not Always Our Aim.

Our most particular attention is given to prompt and skillful handling of all electrical work of any nature with "QUALITY AND SERVICE GUARANTEED."

Our nation-wide organization and large experience in this field assures you always of fair estimates and absolute satisfaction.

F. E. NEWBERY ELECTRIC CO.

163 Sutter St. (413 Lick Bldg.) San Francisco, Phone Sutter 521

ASBESTOS PROTECTED METAL FOR ROOFING AND SIDING

For permanent industrial buildings of all classes.
Economical — Low maintenance.
Permanent without paint under the most severe conditions of service.

ASBESTOS PROTECTED METAL CO. Ask for Bulletin.

First National Bank Bldg., PITTSBURGH San Francisco Office, Hobart Bldg.

C. JORGENSEN & CO.

BUILDING MATERIALS

Phone Kearny 2386 20 Crossley Building, SAN FRANCISCO

LUXFER
SIDEWALK LIGHTS
TRANSOM PRISMS

TOCH BROS.
"LIQUID KONKERIT"
"TOXEMENT"

JAS. P. DWAN, Hearst Bldg., San Francisco Phone Douglas 3199

DESIGNERS OF FIXTURES

GOOLD & JOHNS

ELECTRICAL CONTRACTORS AND ENGINEERS

Phone 1-1-1-1 113 S. California St., STOCKTON, CAL.

San Francisco, Cal. Oakland, Cal. Los Angeles, Cal.

NEPAGE, McKENNY CO.

Electrical Engineers and Contractors

Phone Sutter 2369 149 New Montgomery St., San Francisco, Cal.

H. W. Fincke Geo. C. Derby

IDEAL HEATING & ENGINEERING CO.

FAN SYSTEMS FOR HEATING AND COOLING

General Sheet Metal Work Warm Air Furnaces
Ideal Air Washers Blow Pipe Systems

PHONE MARKET 3708 192 ERIE STREET, SAN FRANCISCO

MULLEN MANUFACTURING CO.

BANK, STORE AND OFFICE FIXTURES—CABINET WORK OF GUARANTEED QUALITY—BAR FIXTURES DESIGNED, MANUFACTURED AND INSTALLED

Telephone Market 8692 Office and Factory: 64 Ralsch St., Bet. 7th and 8th, San Francisco

That means that in some cases the owner pays more than a fair price for the job. He is helping to average up the general run of work, and his excess payment offsets the too small amount charged on an unprofitable job. This is obviously an inequitable system, and furnishes a legitimate argument for the use of the percentage system.

One of the chief advantages to the contractor is that suggested above. He can get the benefit of accumulated good will and the prestige which goes with a record of big jobs well handled. While it is not necessary that the architect let the contract in every case to the low bidder, the inclination is always in that direction; and thus the inexperienced and the unskilled, who know neither how to figure the cost of a job nor how to handle it to the best advantage, are likely to get work to which those who have proved themselves in previous jobs are really entitled. That is one of the glaring weaknesses of the present system. The lowest and best bidder is the man to whom the contract, in theory, should be awarded; but in actual practice it is more often the low man than the best man who gets the business. Contractors have learned this, and know that only when their bid is pretty close to the bottom will they be given serious consideration.

It must not be thought, however, that the percentage idea solves all problems and makes life's path easy for the contractor. There are difficulties and irritations involved here as well as under any other system, for no change in methods will change human nature. The contractor who is inclined to beat the owner under a bidding system will probably attempt the same thing under a percentage plan.

In fact, cases have been cited in which the contractor padded his expense bills, charging the owner with the list price for material, without showing the discounts received. Time for labor was also increased, helpers being put in at full wages, and other features of that kind developing. Carelessness in buying and using material when the owner is footing the bills is also apparent in some jobs handled on a percentage plan, and when this occurs the system is given a bad name.

Another difficulty is determining just what the percentage should be. And, after all, here is an opportunity for bidders to be pitted against each other; for the man who agrees to do the work for the smallest percentage over and above the cost of material and labor, other things being equal, is likely to get the job. So adopting this plan does not entirely solve the problem.

"The percentage system has been given undeserved unpopularity among certain owners and architects," said a well-known builder recently, "because of their experience in dealing with contractors who did not play fair. It might be said that under such a system the owner would be foolish to give his work to anybody except those whom he knows he can trust completely. But if one man is willing to work for a smaller margin than another, he is likely to be given the contract. The contractor of this kind may think that it is legitimate to make up for a narrow margin of profit by padding his bills and get his profit in some other way; but we believe in laying all our cards on the table and stating at the beginning just what the charge is going to be, above the cost of labor and material."

Taking it all in all and in view of the experience of leading concerns like the one cited in this article, it seems that the percentage system is making good and has come to stay.

New Yorker Likes This Magazine

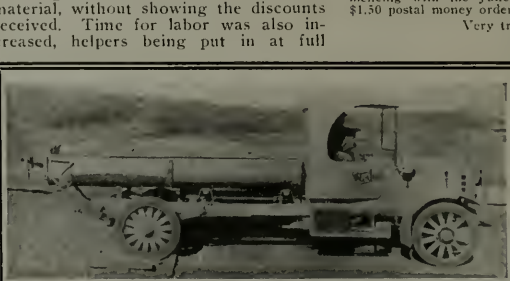
New York City, N. Y., June 15, 1917.

Publishers The Architect and Engineer.

Dear Sirs:—I am deeply interested in your publication, The Architect and Engineer, and would like to have it mailed to me for one year, commencing with the June number. You will find $1.50 postal money order enclosed.

Very truly yours,

THOMAS T. ONO.



STERLING MOTOR TRUCKS

A complete line in stock for immediate delivery.

EDWARD R. BACON COMPANY, Pacific Coast Agents
51-53 Minna Street, San Francisco Telephone Sutter 1675

Superstition

There are men who will not start a job on Friday. There are others who will not rent a house numbered 13 or 1313, or will not begin an important piece of work on the 13th of the month, or will not rent offices on the 13th floor of a building.

Happily the number of those who are under the sway of superstitions of this sort is lessening. Architects occasionally encounter clients, however, who have unaccountable prejudices of some sort, and it is, of course, necessary to respect these personal whims, and to avoid any conjunction of dates or numbers, or any other thing that the client may consider unlucky. Very often the client is unwilling to acknowledge his pet superstition, because his better judgment rejects it as nonsensical, but notwithstanding the fact that his reason rejects it there is at the bottom of his consciousness a feeling that he will not be quite at ease if his pet superstition is ruthlessly trampled under foot. So he is put to some straits to assign some plausible reason to the objection which really is due to a superstition implanted in his mind in childhood.

Happily for architects and for real estate men, superstition seldom reaches the stage described in The Architects' and Builders' Journal, which says: "We know of a house of which the rent had to be lowered because of the reluctance to inhabit it on the showing that No. 175 is essentially 1 plus 7 plus 5, which equals 13, which is mere foolishness, but seems to have been turned to account to the detriment of the landlord."

It may be remarked that even the most ingenious architect has never found a satisfactory way to omit the thirteenth story from a sixteen-story building.

Gypsum in Building Construction

AS an aid in building construction, gypsum is attaining an ever-growing popularity, use of the product in such connection being many times greater today than it was some years ago.

The Federal Government reports that nearly half a million tons of uncalcined gypsum is sold annually, "the bulk of it being used for retarder in Portland cement."

"Calcined gypsum," to quote from the Government's latest report, "amounting to about a million and a half tons annually is used as wall plaster. This use and the qualities of the plaster, such as hardness, quick set, fire resistance and poor conductivity of heat and cold, are so well known that further discussion will not be given here.

"The making of gypsum board, tile and screed is the newest branch of the industry and has not yet attained any

THE FLOOR OF
Durability and Distinction
Double Diamond Interlocking Rubber Tiling

There is no other flooring quite as durable as **Double Diamond Interlocking Rubber Tiling.**

It adds greatly to the appearance of any space in which it may be placed.

It can be made in any combination of color or design to harmonize with interior decorations.

It is noiseless, non-slipping, waterproof, sanitary, and by long odds the most durable floor covering made.

TWENTY TONS OF IT INSTALLED IN THE NEW STANDARD OIL BUILDING, SAN FRANCISCO.

— For —

BANKS — HOSPITALS
OFFICE BUILDINGS — LIBRARIES
CHURCHES — R. R. DEPOTS
THEATRES—ELEVATORS — RESIDENCES

New York Belting and Packing Co.
New York
San Francisco Branch
519 MISSION STREET
Phone Douglas 1837
Small booklet of designs mailed on request.

When writing to Advertisers please mention this magazine

Master Builders Method

Master Builders Method — with Master Builders Concrete Hardner — is standard practice the world over for the construction of concrete floors that are Dustproof, Wearproof and Waterproof. More than 21,000 satisfied users. Over 80,000,000 sq. ft. in every-day use. Makes the ideal type of floor for all buildings where floor service is essential and the elimination of dust is necessary. Send for our "Primer"—a complete text book on the subject of better concrete floors. Sent FREE, without obligation.

THE MASTER BUILDERS COMPANY

Mokers of Master Builders Concrete Hardner; Master Builders Red Concrete Hardner; Master Builders Black Concrete Hardner; Roadyte Concrete Hardner for Concrete Roads; Saniseal Liquid Concrete Hardner.

Main Office and Works: CLEVELAND, OHIO.

AGENTS

Colvin & Hoskins
Spokane, Wash.
Raymond C. Grant
Helena, Mont.
Sam Hunter Co.
Seattle, Wash.
F. S. Cook & Co.
Portland, Ore.
C. Roman Co.
San Francisco, Cal.
A. E. Banks,
Los Angeles, Cal.
S. A. Roberts & Co.
Salt Lake City, Utah

considerable proportions; at least, the total value of the annual production of this material is probably less than $200,000. The statistical cards sent out by the Geological Survey do not ask specifically for reports on these products. Nevertheless, the reports for 1915 show that they were made at twelve plants in that year. .

"Gypsum plaster boards are of various types, mainly consisting of gypsum mixed with fibrous binding material to give strength and toughness for effective nailing. A type of plaster board in common use consists of four alternate layers of wool felt, with three intermediate layers of gypsum. Other boards contain but two layers of felt, with a gypsum layer between. In order to meet the joint and stud facing of standard construction, plaster boards are usually 32 by 36 inches (8 square feet) and are made one-fourth, three-eighths and one-half inch in thickness. The wool felt binding material forming the outside surface of the plaster boards is an excellent bonding surface for gypsum plaster. Plaster boards are used for lathing in place of wood or metal lath on surfaces that are to be plastered, and where high fire-resistive construction is required. In fireproof construction the plaster boards are fastened to metal studs or hangers by metal clips. On surfaces not to be plastered plaster boards are used for deadening sound by being laid between rough and finished floors; as sheathing boards by being nailed to the studding and behind the clapboards; as outside stucco covering; as insulation and fire resistance under wood shingles, in air ducts and in dumbwaiter shafts.

"Gypsum floor screeds are used as a nailing sleeper for floors. They are 2 by 3 inches and 8 feet long and weigh 2 pounds per linear foot. They do not rot or burn.

"Gypsum tile is made for partitions, floors, roofs and furring. Partition tile, solid or hollow, is 12 by 30 inches wide and 2 to 8 inches thick. These tiles, laid with gypsum plaster, are used in the highest type of fireproof building for dividing and corridor partitions, in elevator and stairway inclosures and in dumbwaiter shafts; they are light in weight, can be laid very rapidly, can be cut with a handsaw, and when plastered with gypsum make partitions of high heat-resistive value.

"Gypsum floor tile is a hollow box or dome of reinforced gypsum plaster, used as a filler between concrete joist construction. These tiles are 19 inches wide and 24 inches long, 7, 9, 11 and 13 inches high, and weigh 24, 27, 30 and 33 pounds per linear foot; they afford a saving in dead weight of construction and provide a smooth, all-gypsum ceiling to plaster upon.

"Gypsum roof tile is made 24 and 30 inches long, 12 inches wide, and 3 inches thick, and is laid between supporting subpurlin 'T' irons. Larger gypsum roof tile, reinforced and made of especially hard gypsum, are made to span 4 feet and are laid upon the main roof purlins. These tile are 4½ inches thick, 18 inches wide, and of biscuit pattern. All these roof tiles weigh 13 pounds per square foot and are light and noncondensing. The low heat conductivity of gypsum is an especially valuable quality in a roof deck. Slate or any other roof covering can be nailed or otherwise secured to the smooth decks of gypsum roof tile.

"Gypsum furring tile are of the same character and general dimensions as the partition tile, are hollow or solid, and are 2 inches thick. They are fastened to the wall by nailing and are used for sound absorption and soundproofing, fire protection, insulation from heat or cold and damp proofing."

Other uses for calcined gypsum which have been in practice longer than those just described, are in making statuary and other art work, relief maps and models, molds for rubber stamps, molds for pottery and terra cotta, in bedding plate glass for polishing, in foundry molds for special castings, and in making surgical casts. Calcined gypsum enters into the composition of match heads, hat blocks, relief decorations for walls and ceilings, asbestos pipe covering, and is used for various other purposes.

DO YOU USE ANY HIGH GRADE

CABINET or HARDWOODS?

WE MAKE A SPECIALTY OF THEM

PRIMAVERA, MAHOGANY, KOA, JENISERO, OAK, ASH, ETC.

DIECKMANN HARDWOOD CO.

Beach and Taylor Streets, SAN FRANCISCO

GEO. H. DYER, President R. W. DYER, Vice-Pres. W. J. DYER, Sec'y

DYER BROTHERS

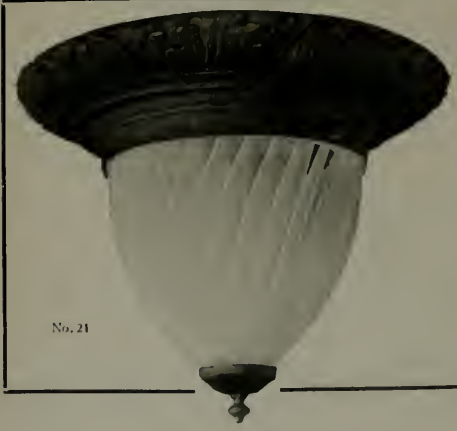
Golden West Iron Works, Inc.

Structural Iron and Steel Contractors

ORNAMENTAL IRON WORK

Office and works:
17th and KANSAS STREETS

SAN FRANCISCO, CAL.
Phone Market 134



No. 21

THE CRYSTAL LIGHT

DAY LIGHT ALL THE TIME.

THE BEST LIGHT FOR ALL PURPOSES

We carry a full line of all sizes and styles and are in a position to work out your own ideas.

MODERN APPLIANCE COMPANY

Sutter Street,
San Francisco, Cal.

DOE LIBRARY, UNIVERSITY OF CALIFORNIA
John Galen Howard, Architect *J. D. Hannah, General Contractor*

Completion of a Notable Library Building

The Doe Library, which has been carried to a successful conclusion by the present extension (which means a practical rebuilding along larger lines) is now completed. It is a monument to the skill of its renowned architect and to its resourceful builder, whose joint labors have produced a structure unequaled for the purposes of a modern university library.

The building is Class A type, with steel frame, concrete walls and granite exterior. The structure covers a ground area 200 feet square and is four stories high. The exterior is of Raymond granite. The cost is approximately $600,000.

Among other important work recently undertaken by J. D. Hannah is the National Carbon Co. factory at Eighth and Brannan streets, San Francisco, costing $400,000 (illustrated in the April Architect and Engineer); a garage and store building on Bush street for the First Federal & Trust Co.; the Steinhart garage on Van Ness avenue; the Olympic garage, for G. H. Umbsen, on Sutter street, and a $250,000 contract for work on Pier No. 3, at the foot of Jackson street, San Francisco.

Concrete Doors, Sashes and Blinds

If coming events cast their shadows, it is evident that concrete will play a more important part than it does today in the building of the future.

The soaring prices of wood, the demand for a permanent building material and the imperative need of a fireproof product, all tend to make concrete a leading material for future builders.

A well-known expert of Springfield, Mass., is responsible for the statement that plans are now nearly perfected for the making of doors, sashes, and even blinds of concrete, and predicts that such items of construction will soon be in practical use, thus enabling one to erect a building that shall have no wood in its construction.

The value of concrete as a permanent building material is shown by the fact that only two per cent depreciation is figured on a reinforced cement building as against six per cent on a wooden building. Then too, especially in factory construction, there is the absence of vibration which undoubtedly saves many thousands of dollars annually in the depreciation of valuable machinery.—Exchange.

Addition to Berkeley High School

Plans have been prepared by Mr. W. H. Ratcliff, Jr., 1st Nat'l Bank Bldg., Berkeley, for a frame addition to the Berkeley High school gymnasium. The addition will provide showers, dressing rooms, officers' and medical examination rooms, and instructor's office.

WALL PAPER ❧ Uhl Bros.

PHONE KEARNY 255 — 38 O'Farrell Street, San Francisco

Phone MISSION 4405

P. R. WARD — Formerly Ward & Goodwin

GENERAL CONTRACTOR

981 GUERRERO STREET — SAN FRANCISCO

ONE PIECE SANITARY DRAINBOARDS, SINKBACKS, FLOORS, WAINSCOTING, ETC.

GERMANWOOD FLOOR CO.

Phone West 4009 — 1621 EDDY STREET, SAN FRANCISCO

HOWARD CO.

CEMENT, ROCK, PLASTER, GRAVEL, BRICK and SAND

Phone Lakeside 27 — 1st and Market Sts., Oakland

G. W. COURTNEY

CONTRACTOR

Phone Franklin 4800 — 160 EDDY STREET, SAN FRANCISCO

L. G. BERGREN & SON

GENERAL CONTRACTORS

347 CALL BUILDING — SAN FRANCISCO, CAL.

PLUMBING — HEATING

NEIL H. DUNN

CONTRACTOR

786 ELLIS STREET S. F. — Phone Franklin 2187

J. B. CROWE

Glass of All Kinds

1372-74-76 TURK ST., SAN FRANCISCO — Tel. West 1398

LANDSCAPE ARCHITECTS
NEAL T. CHILDS COMPANY Phone Sutter 4933
WE PLAN HOME GROUNDS AND REALTY TRACTS 68 POST STREET
TREE SURGERY AND CONSULTING FORESTRY SAN FRANCISCO

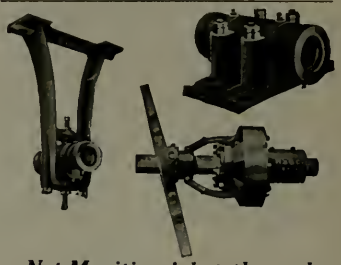
Seattle Architects to the Front

The American Institute of Architects is losing quite a few of its leading members on the Pacific Coast. The following members of Washington State Chapter have joined the colors:

J. S. Cote, secretary of the Chapter, has joined Colonel Cavanaugh's regiment and is in training at American Lake; W. Marbury Somervell has received a commission in the navy and is now in Washington; H. O. Sexsmith, assistant professor of architecture at University of Washington, has been appointed first sergeant in the American Ambulance Corps, University of Washington unit. Of the draughtsmen, Philip French is second lieutenant in the Washington Coast Artillery, Clarence George is a private in the same regiment, George Hungen and B. F. Cole have joined the aviation division of the Signal Corps at San Diego, Clair Kinney is at the Presidio with the Officers' Reserve Corps, Arthur Anderson has joined Col. Cavanaugh's engineer regiment, Burton Carr is in the Officers' Reserve Corps, Frederick A. Hansen is going into the navy, Chas. Williams is in the radio service at the Puget Sound navy yard, Herman Lindhaust, Coast Artillery, Linn J. Bain, outpost company of the Signal Corps, Frederick W. Elwell, Naval Reserve officer, Walter Bogart, Signal Corps.

Architects' Contracts

The statement has frequently been made that fewer than 10 per cent of the agreements under which architects render professional services are expressed in writing. Such a condition, if it exists, is not only one of danger, but it seems to indicate lax business methods. Certain it is that cases in which architects have undertaken important work on mere verbal orders are numerous, and not infrequently the resulting misunderstanding has occasioned loss to one party or the other. A number of these in which there appeared serious disagreements have been submitted to the courts for adjudication.



Not Munitions! but the real force BACK of munitions.

The wheels that turn the mills, the shafts that transmit its life, the bearings that hold the forces within control — without *these*, the fundamentals of industry, the explosion of a shell upon the battlefields for Liberty *would be impossible.*

Yes, we're doing our bit

Meese & Gottfried Company

ENGINEERS AND MANUFACTURERS

Conveying, Elevating, Screening and Mechanical Power Transmitting Machinery

SAN FRANCISCO, SEATTLE, PORTLAND, LOS ANGELES

CHARLES T. PHILLIPS
CONSULTING ENGINEER
PACIFIC BUILDING SAN FRANCISCO
HEATING VENTILATION WIRING ILLUMINATION

Hotel Orlando, Decatur, Illinois. Holmes & Flinn, Chicago, Architects.
All Sheet Metal Work of ARMCO Iron.

Leading Architects Specify

The Iron That's Made To Last

As a result of years of observation of its behavior in service, modern architects are more and more regularly including in their specifications—*"All sheet metal work and metal lath of Armco Iron."*

This is the purest, most even and most carefully made of irons. It is the material chosen by men who look to the future.

AMERICAN ARMCO INGOT IRON

The trade mark ARMCO carries the assurance that iron bearing that mark is manufactured by The American Rolling Mill Company with the skill, intelligence and fidelity associated with its products, and hence can be depended upon to possess in the highest degree the merit claimed for it.

THE AMERICAN ROLLING MILL COMPANY

Licensed Manufacturers under Patents granted to the International Metal Products Company

MIDDLETOWN, OHIO

ARMCO Iron Sheets, Plates, Roofing, Metal Lath and other building products

Pacific Coast Sales Office—Monadnock Building, San Francisco. other Branch Offices in New York, Chicago, Pittsburgh, Cleveland, Detroit, St. Louis, Cincinnati, Atlanta, and Washington, D. C.
An Ample Stock of Armco Iron is Carried at San Francisco.

GOODS OF QUALITY
HM&S

PLUMBING GOODS OF QUALITY

A Completely Equipped Bath Room

THE above is one of several Bath Rooms which may be seen under Water Pressure at our New Up-Town Display Room, 64 SUTTER STREET, San Francisco. Architects and others interested in HIGH GRADE PLUMBING FIXTURES are Cordially Invited to Call.

Holbrook, Merrill & Stetson

DEALERS IN

PLUMBERS' SUPPLIES, IRON PIPE and FITTINGS, METALS
STEAM, WATER and HOT AIR HEATING APPARATUS
STOVES, RANGES and KITCHEN UTENSILS

Main Office and Warehouse
SIXTH, TOWNSEND AND BLUXOME STREETS, SAN FRANCISCO

A definite understanding and written agreement before any work is undertaken, with supplemental modifications, additions or revisions, mutually agreed upon as occasion arises, would prevent these disputes, or render their determination comparatively simple and inexpensive. It is to be hoped that architects will soon come to a realization of this fact in the interest not only of their own incomes, but as a measure that will result in better feeling on the part of the public, and a higher regard in general for the architect's business ability.—American Architect.

Portland News Letter

By A. J. CAPRON.

Stick-to-itiveness finds its reward in any walk of life, be it in war or peace. Contractors and architects have all had their time at the game and the men who have hung on, like a dog to a root, have finally succeeded and the weakling has fallen by the wayside. But while hanging on, one may ask, where, oh, where shall we get the eats? And we may answer—hang on with one hand and eat with the other.

We have in mind some of our Portland architects, who, eating a poor man's breakfast for the past three or four years, are now, with the returning of good times, filled up with business, thanks to their foresightedness. The same story may be said of the contractor—Messrs. Parker & Banfield, for example, "hung on," until today they have contracts which would make a man glad:

Wittenberg-King Company, fruit drying plants at The Dalles and Salem, cost $100,000.

Frazier-McLean Garage, Portland, $50,000.

S. P. & S. freight house, $15,000.

Insane Asylum addition, Salem, $52,000.

Mausoleum, Pendleton, $30,000.

Three of these jobs are from the offices of Messrs. Sutton & Whitney; one is from the office of Mr. Edgar M. Lazarus, and one from the office of Messrs. Lawrence and Holford, associate architects.

Mr. John V. Bennes, one of Portland's leading architects, has taken figures for the Normal school building, Monmouth. This construction will cost about $50,000.

Mr. A. E. Doyle is placing the finishing touches on the United States National Bank building, said to be the finest banking structure in Portland. The outside is classic, while the interior is a dream of elegance and utility.

Mr. Robert F. Tegen is completing the Salem Hospital building, a fireproof structure that will cost $125,000. It will accommodate seventy-five patients.

Messrs. Goodrich & Goodrich have completed plans for a $30,000 apartment house for Dr. Palmer, and the same architects are working on plans for a fraternal building, which is to include hall, lodge rooms and apartments. When completed it will be the most unique group of buildings in Portland.

Messrs. Claussen & Claussen have several residences on the boards.

The war cry, "Buy a Home" is producing results; all the local commercial bodies, backed by real estate concerns, are advertising quite extensively, urging citizens to buy a home.

Ship yards are running over with orders for ships along the Columbia and Willamette rivers. Fully two thousand men are employed and as a whole Portland is enjoying a rise in building operations for which architects and builders have been waiting these several years.

War has made great inroads into the ranks of technical men—the Engineers Corps getting a large number of our best young draughtsmen and engineers, and the several offices are experiencing difficulty in getting the right kind of men for work.

Architects who have gotten a'ong with one room for some time, are enlarging their quarters for increased business.

The Vista House, a marble observatory located 4000 feet above the Columbia river, along the Columbia Highway, will be completed as soon as labor and material can accomplish the fact. From this structure one may command a view of the Columbia thirty miles up and down, and when completed the structure will lend additional fame to this scenic boulevard.

The addition to the Oregon Asylum, Salem, costing $100,000, is progressing rapidly to completion; Mr. Edgar M. Lazarus, architect.

Oregon voters have decided that they are not willing to expend $400,000 for an addition to the Penitentiary. Just why so much more room may be wanted, we know not, but possibly so many freak laws have developed an increased number of law breakers.

Mr. Fred A. Legg, Salem, is crowded with work, mostly business blocks.

Vancouver Barracks is seeing rapid growth in the line of buildings. Grant Smith & Company, Seattle, are erecting 300 cantonments, suitable for accommodating two additional regiments of soldiers.

Mr. J. H. Humphrey, one of San Francisco's architects, recently came here for the purpose of letting contracts for the new Wells Fargo stables and garage. The stables will be 63x118 feet, two stories, with a wagon room, 82x100 feet, and garage.

At the recent election $6,000,000 in bonds were voted for good roads. While Multnomah county will pay the greater portion of this, most of the improvements will be in the rural districts.

MODERN PLUMBING FIXTURES

HAINES, JONES & CADBURY CO.
MAKERS OF PLUMBING SUPPLIES
1130-1144 RIDGE AVENUE PHILADELPHIA
BRANCHES - SAVANNAH AND SAN FRANCISCO
San Francisco Office and Showroom
857 Folsom Street

H. H. LARSEN, 101 Woodland Ave. N. LARSEN, 230 Haight St.
H. H. LARSEN & BRO.
MASONS and BUILDERS
Phone Douglas 4249 Office 62 POST ST., Room 331, San Francisco

ROBERT TROST PHONE MISSION 2209
General Building Contractor
We Specialize in High Grade Work and Employ Skilled Labor in every Branch of the Building Industry.
26th and Howard Streets
SAN FRANCISCO

Atlas Heating and Ventilating Co., Inc.
ENGINEERS and CONTRACTORS
STEAM AND HOT WATER HEATING, FANS, BLOWERS, FURNACES, POWER PLANTS--SHEET METAL WORK
Phone Douglas 378 Fourth and Freelon Sts., Bet. Bryant & Brannan, SAN FRANCISCO.

L. DIOGUARDI, Phone Randolph 2479 CHAS. TERRANOVA, Phone Randolph 2362
DIOGUARDI & TERRANOVA
GENERAL BUILDING CONTRACTORS
Office, 616 Westbank Bldg., 830 Market St., San Francisco Phone Garfield 1907

HEATING VENTILATION
Automatic Sprinkler Systems
FLOOR AND WALL TILING
PLUMBING SHEET METAL WORK
SCOTT CO., INC.
SUCCESSOR TO JOHN G. SUTTON CO.
243 MINNA STREET SAN FRANCISCO

BARRETT & HILP
Concrete Construction & General Contractors
SHARON BUILDING SAN FRANCISCO SUTTER 4598

Telephone DOUGLAS 4109
GRACE & BERNIERI
GENERAL CONTRACTORS
511-513 Claus Spreckels Bldg. SAN FRANCISCO, CAL.

When writing to Advertisers please mention this magazine.

Moreover, the city has gone to the limit in voting $2,500,000 in bonds for a bulk elevator, a thing badly needed for handling the immense grain crops which pass through this port.

In this respect, we have been far behind other Coast points and the need will now be met in the construction of such facilities as will speedily meet the requirements. Tentative plans have already been drawn, and it is expected that construction will commence at an early date.

The new Inter-State bridge nearly met disaster with the flood of the Columbia. The approach from the Vancouver side was washed away and but for the prompt action of the sand bag brigade serious interruption of traffic would have taken place.

Vancouver has secured the location of two ship-yards, both of which have enough orders for several months' work.

A Sanitary Method of Garbage Disposal

It is possible that no other problem has given local health bureaus more worry than the question of sanitary disposal of garbage. This is particularly true in congested tenement districts among the poorer classes. These localities are breeding spots for germ diseases of the most virulent character. Sanitation in the house itself has been brought to a very high state of efficiency by the never-ceasing efforts of those interested in the plumbing industry. It is, therefore, self-evident that disease can not arise from this source. The only other way for disease to generate must be related in some way to the disposal of the garbage. The old battered can standing on the rear porch of each apartment is an invitation to hoards of flies, and the unsanitary dry garbage chute does not prevent the breeding of disease. All those who will take the trouble to look at the accumulation of filth in the interior of the dry garbage chute will be readily convinced of this fact. The practice of throwing water down the dry garbage chute once a day does not relieve, but increases the menace. As this is done but once a day, garbage deposited in the chute has had time to adhere to and dry on the walls of the chute. The bucket of water thrown down the chute merely converts the dry garbage in the can into a liquid mass which more readily decomposes.

The Bradshaw Sanitary Garbage chute is an innovation which is well worth careful investigation by every owner, architect and engineer who has in mind the welfare of the tenants of an apartment house or flat. The chute itself resembles not a little the old type dry garbage chute. Difference of operation, however, is very marked. Each hopper is connected to the water supply and is

BEAVER BLACKBOARD
BEAVER GREENBOARD
SCHOOL FURNITURE
AND SUPPLIES—
OFFICE, BANK AND
COURTHOUSE FURNITURE—
THEATRE AND
AUDITORIUM SEATING
Rucker-Fuller Desk Co.
677 Mission St., SAN FRANCISCO, CAL.
120 So. Spring St., LOS ANGELES, CAL.
432 - 14th Street - OAKLAND, CAL.

JOHN CHANNING
EXPERIENCED IN PHOTOGRAPHY
FOR ARCHITECTS AND ENGINEERS
Commercial
PHOTOGRAPHY
All Branches
TEL. FRANKLIN 8875
Dean Building, San Francisco

FOR SALE
PENDING Reorganization of The Colorado Yule Marble Company, we offer for sale an unlimited quantity of rough White Veined Marble Blocks. Special price for quarry selection.
Communicate with
J. F. MANNING, Receiver,
MARBLE, COLORADO.

Western Vacuum Supply Co.
CALIFORNIA AGENTS FOR
Palm Vacuum Cleaners
ANY SERVICE
ANY CAPACITY
Plants Noiseless in Operation
Office and Demonstrating Room:
1125 Market St. Telephone Park 4294
Rialto Theatre Building San Francisco

When writing to Advertisers please mention this magazine

equipped with a valve which operates upon raising the lid. The water is discharged from the upper rim of the hopper with a whirling motion lubricating the entire pipe before the garbage is deposited, washing it down into the can, and afterwards cleansing the pipe. Two or three pints of water are all that is necessary. The receptacle, or can, at the bottom of the chute is connected to the sewer and is protected by a double fine mesh screen which permits the liquid to flow through into the outer pipe, but prevents the solid garbage from entering the sewer. The chute is vented to the roof line with a pipe of the same diameter and this can be screened to prevent the entrance of flies. The lid of the hopper fits tightly and this also prevents the entrance of flies. Taking it all in all this chute is as near fly-proof as any garbage disposal device can be made. The chute is practically odorless and can, where the appearance of the building requires it, be installed in the interior of the house.

A large number of these chutes have been installed in San Francisco and vicinity and are giving perfect satisfaction. The chute, therefore, is not an untried experiment. It has proven its value in all cases where installed and bears the unqualified approval of the Board of Public Health.

Garbage disposal is a problem which apparently appeals to the average owner as a matter of minor importance, but in reality is just as important as any other problem which bears upon the health of tenants who are forced to live in crowded quarters.

Mill Work of Gimbal Bros. Building

To the Mullen Manufacturing Company, 64 Raisch street, San Francisco, is due much credit for their excellent work, as shown in partitions, counters, paneling, files, shelving, etc., on the ground floor of the Gimbal building illustrated elsewhere. Besides private offices there are the sales offices, stock room, etc. The turning is skilfully done and the woods used most carefully selected, so that the effect secured is unusually pleasing and satisfactory. Mullen Mfg. Co. are winning many laurels for their artistic wood work on interiors of churches, lodge rooms, stores, offices, etc. They would be pleased to figure with such architects as desire not only low prices, but also a superior order of workmanship.

Big Order for Ball Bearing Elevator Door Hangers

The Reliance Ball Bearing Door Company will supply the ball bearing hangers for the elevator doors of the Hotel Commonwealth, New York's monster hostelry, which will soon rise to cover an entire block-front in the Times Square district. This company was the first to introduce the ball bearing hanger, so superior in every way to the old-fashioned method of using wheels.

The Reliance company has furnished the hangers for many of the largest hotels in this country but the Commonwealth will be the greatest of them all, with its 28 stories and its 2,500 rooms, ranging from $1.50 per day (with bath) upwards. Costing a total of $15,000,000, the Hotel Commonwealth will be owned and operated by approximately 100,000 shareholders representing every section of the country. A share costs $100, and no one will be allowed to subscribe for more than ten. It is the greatest co-operative enterprise ever undertaken in America, and with its army of owners, its patronage should be assured from the moment its doors are opened for business.

Besides dividends and rebates upon expenditures for food and lodging, shareholders will be entitled to club privileges at the Commonwealth and will receive discounts on purchases at New York shops through the shopping bureau.

The plan is headed by big business men and firms of national importance, and has been investigated and endorsed by leading publications, among them the "Globe" of New York. Charles H. Ingersoll, the watch manufacturer, is president; W. J. Hoggson will have charge of the erection of the building; H. L. Merry is to be manager.

Review of Recent Books

POWER PLANTS AND REFRIGERATION. John Wiley & Sons, Inc., 32 Fourth avenue, N. Y. 766 pages, 6¾x9¾, illustrated. Price $5.

This new book on Power Plants and Refrigeration, like Volume I on Heating and Ventilation, is a new departure in the literature of mechanical engineering. It is a large sized handbook in flexible binding, covering both the theoretical principles and their practical application to actual problems.

Volume I is said to have been most heartily endorsed by engineers, architects and contractors, and it is believed that Volume II will prove equally useful. Volume III, which is now in preparation, will cover miscellaneous building equipment, including lighting, elevators, vacuum cleaning, sprinkler system, plumbing, etc. The books are splendidly illustrated with line drawings, many of them full-page, giving details of all the necessary equipment.

"Bowserized" Garages are Popular

because they are convenient, safe and a real saving. When you include

BOWSER
ESTABLISHED 1885

Safe Storage Systems

for gasolene and oil in your plans for private, public or commercial garages, you have the assurance that it will give complete, continuous satisfaction to your clients.

Complete Information or Representative on receipt of your telephone or mail request, with no obligation on your part.

S. F. BOWSER & CO. Inc.
Fort Wayne, Indiana
San Francisco Office: 612 Howard Street
Telephone Douglas 4323

FOR THE ARCHITECT

Who specifies a "PITTSBURG" Automatic Gas Water Heater — he is confident that his judgment will be commended.

FOR THE CUSTOMER

Who purchases a "PITTSBURG" Automatic Gas Water Heater — he is assured beyond a doubt of many years of satisfactory Hot Water Service.

PITTSBURG WATER HEATER COMPANY of California
478 Sutter St., San Francisco 402 15th St., Oakland

A Big Thing

New Model No. 65 "Pittsburg-Bungalow" Automatic Water Heater, Capacity three gallons per minute.

FOXCROFT BUILDING, 68 Post Street, San Francisco. Offices Single and in Suite.

HOTEL WHITCOMB

AT THE

CIVIC CENTER

OF

SAN FRANCISCO

¶ Free Garage for Guests.

¶ Dinner in the Arabesque Room, one dollar.

¶ Dancing in the Sun Lounge every Evening except Sunday.

¶ Room with bath, one-fifty and up.

¶ American and European.

J. H. VAN HORNE, Manager

Sand Loading Plant on the Yuba River at Marysville

Delivering Plastering Sand by Boat

Pratt Building Material Co.

PLASTERING, BRICK MORTAR, AND CONCRETE SAND

Marysville, Sacramento, San Francisco

C. DRUCKER J. C. JAMES

JAMES & DRUCKER

PLUMBING—HEATING
CONTRACTORS

Phone Market 275 450 Hayes Street San Francisco

ESTABLISHED 1858

MUELLER

High Grade Faucets
FOR
BATH, LAVATORY AND SINK
Give Long Service, Cut Out Repairs, Fully Warranted

H. MUELLER MFG. CO.
589 Mission St., SAN FRANCISCO

Phone Douglas 3224

Hunter & Hudson

ENGINEERS

Designers of Heating, Ventilating and Wiring Systems. Mechanical and Electrical Equipment of Buildings.

729 Rialto Bldg., San Francisco, Cal.

MARK-LALLY CO.

PLUMBING and STEAM SUPPLIES

"PERFECTION"
FLUSH VALVES

SHOWROOMS AND OFFICE
235-249 2nd St., San Francisco
CALIFORNIA

OAKLAND SAN JOSE Branches FRESNO STOCKTON

PHONE FRANKLIN 5598

THE TORMEY CO.
Versatile Decorators

General Painters
Wall Paper

681 Geary St. San Francisco, Cal.

Phone Sutter 2419

JOHN MONK

GENERAL
CONTRACTOR

316 Sharon Bldg. San Francisco

The McGilvray Stone Company

MASONRY AND STONE CONTRACTORS
OPERATING
Duntrune Quarry, at Sites, Colusa County, Cal.

The McGilvray Raymond Granite Co.

CONTRACTORS
For and Dealers in Granite Work of Every Description
Quarries at Raymond, Cal.

Offices, 634-666 Townsend Street, San Francisco

Phone Garfield 361

A. P. BRADY

Builder

Humboldt Bank Building
San Francisco, Cal.

Phone Sutter 1687

THE RIGNEY TILE CO.

Successors to

CALIFORNIA TILE CONTRACTING CO.

ESTIMATES FURNISHED

Sheldon Building
1st and Market Sts. SAN FRANCISCO

"BLAZING" THE TRAIL

We've been doing it for many years—giving the Sportsman Better Value for Quality than he ever before received. *"Value at a Fair Price"* in everything for the Sportsman.

The Ellery Arms Company
563-85 MARKET ST
SAN FRANCISCO, CAL

SEND FOR CATALOG *The Sign of Quality*

National Surety Company of New York

ASSETS OVER $12,000,000.

The bonds of this Company are accepted by the United States Government in larger amounts than any other Surety Company in the World.

PACIFIC COAST DEPARTMENT,
105 MONTGOMERY STREET,
SAN FRANCISCO, CAL.
Frank L. Gilbert, Vice-President.
Phone, Sutter 2636

KEWANEE WATER SUPPLY SYSTEMS

A Perfect Water Supply to Country Homes, Hotels and Parks.

SIMONDS MACHINERY CO.
117-121 New Montgomery St., San Francisco

Interior Decorations a Specialty
Drapes, Sketches, Color Schemes Furnished on Request

Golden Gate Decorating Co.

704 Polk Street, at Eddy, San Francisco. Tel. Prospect 2685
R. L. McQUADE, Manager

Expert Designers in Home Decorations

House Painting, Graining, Glazing
Expert Paper Hanging
Apartment and Hotel Work a Specialty
Prompt Service—All Work Guaranteed

A. J. FORBES & SON

Established in San Francisco in 1850

Office and Factory, 1530 FILBERT ST., S. F.
Builders Ex. Box 236

Bank, Store and Office Fittings

Special Furniture and Interior Woodwork

MAGNER BROS.

PAINT MAKERS

Floratone Flat Wall Paint
Mabro Concrete Paint
Concrete Floor Paint
Mabro Stipple Paint
Mabro Enamels and Enamel Undercoaters

419-421 Jackson Street,
SAN FRANCISCO, CAL.

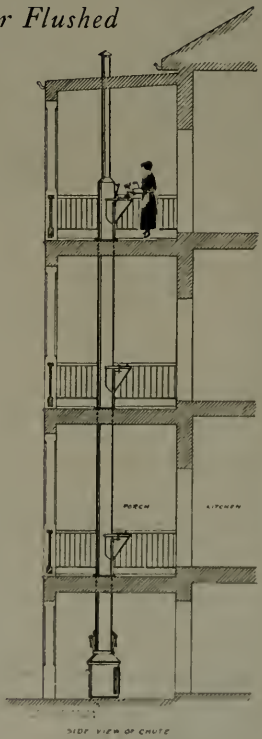
BRADSHAW
Sanitary Garbage Chute

Automatically Water Flushed

Not an Experiment — More than 100 installed in San Francisco and Vicinity.

It is as important to automatically flush a Garbage Chute as it is to flush a Toilet.

OPERATION OF WATER FLUSHED HOPPER



SIDE VIEW OF CHUTE

Approved by the Board of Public Health, San Francisco.

A Life Insurance Policy for your tenants.

Prices upon application to

AYLSWORTH AGENCIES CO.

591 MISSION STREET, SAN FRANCISCO

Sole Agents for the State of California

THE FISH FUEL SYSTEM

The Safest, Cleanest, Hottest Fuel on Earth

This SYSTEM supplies Heat, Light and Power at Lowest Cost. A Commercial Plant in operation at 50-54 8th St., San Francisco. Telephone Market 4070.

UNION GAS-ELECTRIC COMPANY

PALACE HOTEL SAN FRANCISCO

VAN EMON ELEVATOR CO.

Incorporated

Electric (1-1 and 2-1) Gearless Traction Elevators, Electric Geared Elevators, Full Automatic Electric Elevators and Dumb-Waiters, Hydraulic, Belt and Hand Power Elevators for Every Service

Telephone Sutter 3540 54 Natoma Street, San Francisco

Architects and Building Contractors

THE BINDING OF YOUR MAGAZINES and PERIODICALS IS OUR SPECIALTY

Expert Plate and Map Mounting

THE HICKS-JUDD COMPANY

BOOKBINDERS

51-65 FIRST STREET SAN FRANCISCO, CAL.

August F. Fick Albert E. Fick

FICK BROTHRS

PAINTERS, PAPER-HANGERS AND DECORATORS

Dealers in Paints, Oils, Varnishes, Glass

475 HAIGHT ST., San Francisco

Phone Park 4428—Res. Park 2148

When writing to Advertisers please mention this magazine.

More Than Fireproof

Summer Heat Proof
Winter Cold Proof
Damp and Decay Proof

DENISON

INTERLOCKING TILE

TRADE MARK

This tile affords the best possible fire protection, but it goes much further than that.

It builds a wall, honey-combed with separate air cells, which completely break all connection between inside and outside surface of the wall. Even the mortar joints are on different levels with insulating air spaces between. The wall is heat, cold and moisture proof.

The webs or partitions in the tile always come exactly over each other and the tile interlock and bond together, making a wall amply strong without the use of steel. Denison Interlocking Tile is more than fireproof.

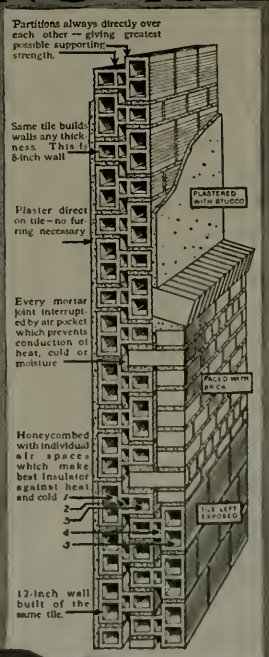
Write for special information on the type of building you are interested in

Denison Interlocking Tile Corp'n

Cleveland, Ohio

920 Forum Bldg.,
Sacramento, Cal.

This unit builds all desirable thicknesses of wall. See drawing below.


Partitions always directly over each other — giving greatest possible supporting strength.
Same tile builds walls any thickness. This is 8-inch wall
Plaster direct on tile — no furring necessary
Every mortar joint interrupted by air pocket which prevents conduction of heat, cold or moisture
Honeycombed with individual air spaces which make best insulator against heat and cold
2
3
4
5
12-inch wall built of the same tile.
PLASTERED with STUCCO
FACED WITH BRICK
TILE LEFT EXPOSED

"FIRE—A CRIME"

We are equipped with two Pacific Coast Factories to manufacture
METAL DOORS—Tin, Kalamein, Composite, Hollow Steel and Bronze,—Swinging, Sliding, Folding, Elevator, Van Kannel Revolving Doors, and Wilson's Steel Rolling Doors.
METAL WINDOWS—Underwriters, Hollow Metal of all kinds, Kalamein, Bronze and Steel Sash.
☞ See the SIMPLEX METAL WINDOW.

United States Metal Products Co.

OF THE PACIFIC COAST

555 Tenth St., San Francisco 750 Keller St., Los Angeles

Agents and Branches in all Coast Cities.

POPE & TALBOT

Manufacturers, Exporters and Dealers in

Lumber, Timber, Piles, Spars, etc.

Office, Yards and Planing Mills
FOOT OF THIRD ST., SAN FRANCISCO, CAL.

Mills, Port Gamble, Port Ludlow and Utsalady, Washington

A. S. MANGRUM, PRES. AND MGR. CHAS. C. HANLEY, SEC'Y AND TREAS.

MANGRUM & OTTER

(INCORPORATED)

TILING MANTELS GRATES

FURNACE AND STEAM HEATING

HOTEL AND KITCHEN OUTFITS
Stoves, Ranges, Refrigerators, Tin and Enameled Ware

Telephone, Kearny 3155 561-563 Mission St., San Francisco

FOR YOUR WATER-PROOFING SPECIFY

TIGEROIL

EQUALLY GOOD FOR IRON, SHEET METAL OR WOOD
A POSITIVE RUST PREVENTIVE AND WOOD PRESERVER

"Tigeroil" is one of the best waterproofing coatings known. It forms a hard, elastic, non-porous coating and is not affected by either salt or fresh water.

It is a transparent preparation, easily applied to metallic surfaces by spraying, brushing or dipping. It forms a thin waterproof coating, guaranteed to exclude all moisture and prevent rust. SAMPLES AND PRICES ON REQUEST. Manufactured by

PACIFIC COAST PAINT CORPORATION

OAKLAND, CALIFORNIA

General Offices and Factory 1111 to 1119 E. 11th St. Phone Merritt 407

San Francisco Office 112 Market St. Phone Sutter 2690

STANDARD VARNISH WORKS

NEW YORK CHICAGO LONDON

SAN FRANCISCO PARIS BERLIN BRUSSELS MELBOURNE

INTERNATIONAL VARNISH CO. Limited TORONTO

LARGEST IN THE WORLD AND FIRST TO ESTABLISH DEFINITE QUALITY STANDARDS

TRADE ELASTICA MARK.

ELASTICA —No 1—

ELASTICA —No 2—

ELASTICA Floor Finish

ELASTICA Cabinet Finish

KLEARTONE Stains

Architectural Varnishes

One for every class of work

Satinette ENAMEL

IMMACULATE

BERRY BROTHERS CELEBRATED VARNISHES DETROIT

A Common Sense Suggestion

If the owner is interested enough to select the wood he desires for his interior trim, surely equal care should be taken to get the finish that will bring out the beauty of the wood and preserve it.

To anyone who would like more tangible evidence as to the character of our "Finishes" we will be pleased to mail, postpaid, finished specimens of wood, bearing printed labels showing how the finishing was done.

BERRY BROTHERS
INCORPORATED
World's Largest Varnish Makers

250-256 FIRST STREET, SAN FRANCISCO, CAL.

DETROIT CHICAGO NEW YORK WALKERVILLE, ONT.

Vacuum cleaning for apartments and residences

It is now general practice to specify for vacuum cleaning in buildings of appreciable size, just as for heating requirements.

These 26 apartments, equipped with an ARCO WAND Vacuum Cleaner. Owner says machine after two years' use gives perfect satisfaction. Used with equal success in hundreds of apartment buildings

ARCO WAND VACUUM CLEANER may be specified for small or large buildings of any kind. Made in one or two sweeper capacity and with tool equipment to fill any need. The ARCO WAND has given universal satisfaction and has never failed the test of continuous daily service.

ARCO WAND Single Sweeper Machine also made as two sweeper and mounted on truck

We are pleased to give the architect and engineer all possible help by furnishing vacuum cleaning data and full information.

The ARCO WAND may be seen in operation in any of our showrooms.

AMERICAN RADIATOR COMPANY

Sales branches and showrooms in all the large cities

San Francisco Branch **Second and Townsend Streets**

There are more Industrial Buildings under construction and being planned in California today than ever before. Many of them are concrete.

Architects and Consulting Engineers specify and Contractors Buy ONLY Clean Gravel and Crushed Rock for their Concrete Mix.

California Building Material Co.

Office, 500-4 NEW CALL BUILDING, SAN FRANCISCO

Phone Sutter 4845 Plant at Niles, Cal.

ROBERT W. HUNT JNO. J. CONE JAS. C. HALLSTED D. W. MCNAUGHER

ROBERT W. HUNT & CO., ENGINEERS

BUREAU OF INSPECTION TESTS AND CONSULTATION

251 KEARNY ST., SAN FRANCISCO

NEW YORK LONDON CHICAGO PITTSBURGH ST. LOUIS SEATTLE TORONTO MEXICO CITY

CEMENT INSPECTION

INSPECTION OF STRUCTURAL AND REINFORCING STEEL

REPORTS AND ESTIMATES ON PROPERTIES AND PROCESSES

CHEMICAL AND PHYSICAL TESTING LABORATORIES

MOUNT DIABLO CEMENT

COWELL SANTA CRUZ LIME

ALL KINDS OF

BUILDING MATERIALS

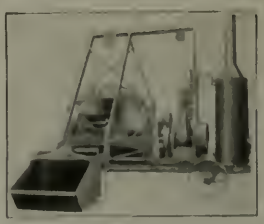
HENRY COWELL LIME AND CEMENT CO.

Phone Kearny 2095 No. 2 MARKET STREET, SAN FRANCISCO

AUSTIN IMPROVED CUBE CONCRETE MIXERS

Made the World's Best Records on the Panama Canal and the Los Angeles Aqueduct.

Built in ten sizes $2\frac{1}{2}$ to 64 cubic feet capacity. "Special machines for street and road paving."



MEMBER OF NATIONAL MIXER MNFRS

Our Mixer Capacities Based on N. A. M. M. Wet Batch Rating

Municipal Engineering and Contracting Co.

Main Office, Railway Exchange, CHICAGO

Represented by J. H. HANSEN & CO.

BALBOA BLDG., San Francisco. Telephone Douglas 736

GEO. S. MacGRUER
258 Connecticut St. Phone Park 7700

ROBERT M. SIMPSON
483 Monadnock Bldg. Phone Douglas 5889

MacGRUER & CO.
CONTRACTING PLASTERERS
PLAIN AND ORNAMENTAL

Members Builders Exchange
180 Jessie St. Phone Sutter 6700

SAN FRANCISCO

WM. F. WILSON COMPANY
MODERN SANITARY APPLIANCES
Special Systems of Plumbing for Residences, Hotels, Schools, Colleges, Office Buildings, Etc.
Phone Sutter 357 328-330 Mason Street, San Francisco.

A. C. SCHINDLER, President. CHAS. F. STAUFFACHER, Secretary
THE FINK & SCHINDLER CO.
Manufacturers of INTERIOR WOODWORK AND FIXTURES
BANK, OFFICE AND STORE FITTINGS
SPECIAL FURNITURE
218-228 THIRTEENTH ST
Bet. Mission and Howard Sts.
SAN FRANCISCO, CAL.
Telephone: Market 474

J. A. Nelson
J. C. Hurley

J. C. HURLEY CO.

Telephone
Garfield 1959

CONSTRUCTING ENGINEERS
Heating and Ventilating Systems 509-511 Sixth St., SAN FRANCISCO

Underwriters' Labelled Fire Doors and Windows—Kalamein Interior Metal Doors and Trim — Metal Corner Bead — Metal Furniture, etc.

Capitol Sheet Metal Works
Manufacturer of INC.
SHEET METAL PRODUCTS
San Francisco Office and Factory, 1927-1935 MARKET STREET
Oakland Office and Factory, 117-119 FRANKLIN STREET

Phone Prospect 5491
ART WALL PAPER CO.
PAINTERS AND DECORATORS
HIGH CLASS WORK OUR SPECIALTY
Office and Salesroom: 508 ELLIS ST. SAN FRANCISCO, CAL.

Phone Franklin 548
I. R. KISSEL
Decorator, Painter and Paperhanger
1747 SACRAMENTO ST., Bet. Polk St. and Van Ness Ave., SAN FRANCISCO

TEICHERT & AMBROSE
Contractors & Engineers
OCHSNER BUILDING SACRAMENTO, CAL.

For Modern RESIDENCES *and* APARTMENTS

PROMETHEUS

The Electric Food and Plate Warmer

Tenants of high-class apartments regard Prometheus as a household necessity—as much so in keeping meals warm as the refrigerator in keeping food cold. Owners are installing Prometheus as an additional means of securing new and holding old tenants.

Prometheus keeps the meal steaming hot without injuring finest china. Wireless heating units of practically unlimited life, placed independent of shelves, are used exclusively.

THE PROMETHEUS ELECTRIC CO., Manufacturers
M. E. HAMMOND, 217 Humboldt Bank Building, San Francisco

S. P. McCLENAHAN
ARBORCULTURIST

GRADUATE—TREE SURGERY
SPRAYING
ORCHARD WORK

738 MERCHANTS EXCHANGE BLDG.
Kearny 4457
SAN FRANCISCO

Wall Beds *(Investigate)*

Our 1917 Model of Reversible Bed
HAS COME TO STAY, AND IS NOW BEING ADOPTED
IN APARTMENT HOUSES EVERY DAY

1917

739 Mission St.
'Phone Sutter 3367

PERFECTION DISAPPEARING BED CO., Inc.

O'HARA & LIVERMORE
Designers of
INTERIOR DECORATION
IN ALL ITS BRANCHES

- STUDIOS AT -

522 Sutter Street
SAN FRANCISCO, CAL.
Tel. Sutter 284

253 E. Colorado Street
PASADENA, CAL.
Fair Oaks 2175

HEATING-PLUMBING

COMPLETE PLUMBING AND HEATING SYSTEMS INSTALLED IN ALL CLASSES OF BUILDINGS ALSO POWER PLANTS

GILLEY-SCHMID CO., Inc.

198 OTIS STREET, SAN FRANCISCO.
Tel. MARKET 965

Phone Franklin 1006

Alex. Coleman

CONTRACTING PLUMBER

706 Ellis Street, San Francisco, Cal.

McCRAY REFRIGERATORS

BUILT TO ORDER
FOR
Home, Restaurant, Hotel or Club

We Carry a Full Line of Stock Sizes

NATHAN DOHRMANN CO.
Selling Agents
Geary and Stockton Sts., San Francisco

W. C. DUNCAN & CO.

General Contractors

508 Sharon Bldg. San Francisco

THE SPENCER TURBINE VACUUM CLEANER

SAVES MONEY

Easily installed in old as well as new buildings—Operates by Electricity—Twelve sizes ranging from 1_2 to 40 horse power.

HUGHSON & MERTON CO.
AGENTS
530 Golden Gate Ave.
San Francisco

SIMPLEX STANDARD CRUDE OIL BURNERS

Safety First
Simplicity Next
Efficiency and Quality all the Time
1916 Model—Price Right

Write to
American Standard Oil Burner Co.
7th and Cedar Sts. OAKLAND, CAL.

Locks and Hardware

Representative for LOCKWOOD MFG. CO'S Builders' Hardware.

Display Rooms—7th and TOWNSEND STREETS, San Francisco

PACIFIC HARDWARE & STEEL CO.

The Granite Work on Eldorado County Courthouse; National Bank of D. O. Mills, Sacramento;—and Sen. Nixon Mausoleum, Reno, WAS FURNISHED BY

CALIFORNIA GRANITE COMPANY

Phone Sutter 2646 STONE CONTRACTORS

San Francisco Office, 518 Sharon Bldg. Quarries, Rocklin and Porterville

Main Office, Rocklin, Placer Co., Cal. Telephone Main 82

SARGENT

REG. U. S. PAT. OFF

BUILDING HARDWARE

BENNETT BROS.

514-516 Market Street

SAN FRANCISCO - CAL.

E. E. CARNAHAN
1403 McAllister St., Phone West 3608

E. S. MULFORD
1282 Sacramento St., Phone Franklin 8776

CARNAHAN & MULFORD

GENERAL CONTRACTORS

Telephone Kearny 4195 504 LUNING BLDG. 45 Kearny St., San Francisco, Cal

O. BAMANN, President ERNEST HELD, Vice-President

HOME MANUFACTURING CO.

BANK, STORE AND OFFICE FITTINGS
FURNITURE AND HARDWOOD INTERIORS
CABINET WORK OF EVERY DESCRIPTION

543 and 545 BRANNAN ST. Phone Kearny 1514 San Francisco, Cal.

PACIFIC MANUFACTURING COMPANY

MILLWORK, SASH AND DOORS

Hardwood Interior Trim a Specialty

MAIN OFFICE:
SANTA CLARA, CAL.

SAN FRANCISCO OFFICE, 177 Stevenson Street
OAKLAND.....486 Tenth Street
BERKELEY.....2143 Center Street
SAN JOSE.....16 N. First Street

MOST PRACTICAL and ECONOMICAL ARRANGEMENT for the MODERN EFFICIENT EQUIPMENT OF SCHOOL STAGES FURNISHED GRATIS

We have equipped 95% of those built in California

REFERENCES — Orpheum, Pantages or Empress Theatres, San Francisco. All Turner & Dahnken Houses. Theatres everywhere. Manual Arts High, Los Angeles. Chaffee Union High, Ontario. Santa Cruz High School. Bakersfield High School. And over one hundred others.

HIGHEST GRADE ARTISTIC WORKMANSHIP—CONTINUOUS HELPFUL SERVICE.

EDWIN H. FLAGG SCENIC CO. 1638 LONG BEACH AVE., LOS ANGELES 510 PANTAGES BLDG., SAN FRANCISCO

Thomas Elam Grover C. Elam

THOMAS ELAM & SON

GENERAL CONTRACTORS

Office, Builders' Exchange
180 Jessie Street

SAN FRANCISCO
Phone Sutter 6700

Phone Sutter 1533

FOSTER VOGT COMPANY

CONTRACTORS

411 Sharon Building SAN FRANCISCO

Pile Driving
Concrete Foundations
Fire Proofing
Building Construction

When writing to Advertisers please mention this magazine

STOCKHOLM & ALLYN
GENERAL CONTRACTORS
Telephone Douglas 4657 — Monadnock Building, San Francisco

A. KNOWLES — R. H. MATHEWSON
KNOWLES & MATHEWSON
CONTRACTORS AND ENGINEERS
Fireproof and Reinforced Concrete Construction
442 Call Bldg., San Francisco, Cal.
Phone Sutter 4712

GRAVEL-ROCK Quick Service any point in the San Joaquin Valley, Calif.
GRANT ROCK AND GRAVEL COMPANY
327-328 Cory Building — FRESNO, CALIF.

GEO. FARRELL, BURLINGAME
Res. Phone Burlingame 1045
W. N. REED, 239 PRECITA AVE.
Res. Phone Valencia 6020
FARRELL & REED
CONTRACTORS
PHONE SUTTER 450
9th FLOOR GUNST BLDG.
709 MISSION STREET, Cor. 3rd
SAN FRANCISCO, CALIF.

MILLER-ENWRIGHT CO.
SACRAMENTO, CAL.
PLUMBING SUPPLIES
STEAM and PIPE FITTINGS, VALVES, Etc.
PIPE—ALL KINDS
STEAM AND HOT WATER BOILERS
PENINSULAR HOT AIR FURNACES
Catalogues on Application

Before writing your Window Specifications, call up
Richard Spencer
(Kearny 2915)
WATSON METAL SCREENS
MONARCH METAL WEATHER STRIPS
WALGER AWNINGS
WHITNEY CASEMENT WINDOWS
801-803 Hearst Bldg., San Francisco

A. LETTICH
365 FELL ST., SAN FRANCISCO
Telephone — Park 234
Plumbing

C. D. VEZEY — O. G. LAWTON
LAWTON & VEZEY
BUILDING CONSTRUCTION
PHONE LAKESIDE 91 — 206 PLAZA BUILDING, OAKLAND

CITY OF PARIS
Decorative Studios
GEARY AND STOCKTON STS. SAN FRANCISCO

Capital $1,000,000 CALIFORNIA DEPARTMENT Surplus $4,014,186.62
THE FIDELITY AND CASUALTY COMPANY OF NEW YORK
Prompt Service for
BONDS AND CASUALTY INSURANCE
203-206 Merchants Exchange Building SAN FRANCISCO, CAL.

ANY PLACE ANY TIME PROMPTLY "We Serve You"
ROBERTSON & HALL
GENERAL INSURANCE
Phone Sutter 2750 First National Bank Building, San Francisco

INSURANCE SURETY BONDS
J. T. COSTELLO CO.
INSURANCE BROKERS
216 Pine Street, San Francisco Phone Sutter 188

Telephone Sutter 5231 Member Insurance Brokers' Exchange
FRED H. BOGGS
INSURANCE
Foxcroft Building, 68 Post Street SAN FRANCISCO

CONTRACT BONDS
Fidelity and Surety Bonds of every kind.
C. K. BENNETT, Manager
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
Telephone Kearny 1452 701 Insurance Exchange, San Francisco, Calif.

PACIFIC DEPARTMENT
Globe Indemnity Company
BONDS and CASUALTY INSURANCE for CONTRACTORS
120 Leidesdorff Street Phone Sutter 2280 SAN FRANCISCO

CONCRETE ENGINEERING CO.
MEYER SYSTEM METAL FORMS FOR CONCRETE FLOORS
433 Rialto Building, San Francisco. Home Office, Omaha

Phone Kearny 3526

A. H. Bergstrom
Eric Lange

LANGE & BERGSTROM
BUILDING CONTRACTORS
(ESTABLISHED 1900)

207-210 Sharon Bldg. San Francisco

Phone Market 776

WILLIAMS BROS. & HENDERSON

E. F. Henderson *Chas. Williams*

BUILDING CONTRACTORS

381 TENTH STREET *SAN FRANCISCO*

Member Builders' Exchange
180 Jessie Street
Telephone Sutter 6700

Residence 2909 California Street
Telephone Fillmore 1427

C. C. MOREHOUSE

Plain and Ornamental PLASTERING. Imitation STONE WORK of All Kinds
Exterior CEMENT PLASTERING. Metal FURRING and LATHING
MODELING and CASTING. STUCCO WORK

Office and Shop: 872 FOLSOM ST., San Francisco
TELEPHONE SUTTER 6509

ARTHUR ARLETT

BUILDING CONSTRUCTION

CALL BUILDING SAN FRANCISCO

When writing to Advertisers please mention this magazine.

MONSON BROS. Phone Market 2693

CONTRACTORS and BUILDERS

502 Clunie Building SAN FRANCISCO Shop, 1907 Bryant St.

Phone KEARNY 3021

GEORGE A. BOS

GENERAL CONTRACTOR HEARST BUILDING
CONSULTING ENGINEER SAN FRANCISCO

P. A. Palmer Peter Petersen W. L. Kelley O. G. Hoaas

PALMER & PETERSEN

Contracting Engineers

774-776 Monadnock Building SAN FRANCISCO, CAL.

AMERICAN CONCRETE CO.

JOSEPH PASQUALETTI, Manager

BUILDING CONSTRUCTION

1704 HUMBOLDT BANK BUILDING 785 Market Street, SAN FRANCISCO

C. L. WOLD Office Phone Sutter 4971 JOSEPH DUNN

C. L. WOLD COMPANY

GENERAL CONTRACTORS

75 SUTTER STREET, Cor. Montgomery, SAN FRANCISCO

GENERAL CONTRACTORS ASSOCIATION Phone Sutter 3580

HOUGHTON CONSTRUCTION CO.

Successor to
VAN SANT, HOUGHTON & CO.

Engineering and Construction

Offices, Hooker & Lent Bldg., San Francisco Century Bldg., Denver

J. D. HANNAH

Contractor and Builder

OFFICE. 725 Chronicle Building Telephone Douglas 885
San Francisco, Cal. BUILDERS EXCHANGE, 180 JESSIE STREET

D. ZELINSKY & SONS

INCORPORATED

PAINTERS AND DECORATORS

420 TURK STREET, SAN FRANCISCO

UNITED STATES STEEL PRODUCTS CO.

Rialto Building, San Francisco

SELLERS of the products of the American Bridge Co., American Sheet and Tin Plate Co., American Steel and Wire Co., Carnegie Steel Co., Illinois Steel Co., National Tube Co., Lorain Steel Co., Shelby Steel Tube Co., Tennessee Coal, Iron and Railroad Co., Trenton Iron Co.

MANUFACTURERS OF

Structural Steel for Every Purpose — Bridges, Railway and Highway — "Triangle Mesh" Wire Concrete Reinforcement — Plain and Twisted Reinforcing Bars — Plates, Shapes and Sheets of Every Description — Rails, Splice Bars, Bolts, Nuts, etc. — Wrought Pipe, Valves, Fittings, Trolley Poles — Frogs, Switches and Crossings for Steam Railway and Street Railway — "Shelby" Seamless Boiler Tubes and Mechanical Tubing—"Americore" and "Globe" Rubber Covered Wire and Cables — "Reliance" Weatherproof Copper and Iron Line Wire—"American" Wire Rope, Rail Bonds, Springs, Woven Wire Fencing and Poultry Netting — Tramways, etc.

United States Steel Products Co.

OFFICES AND WAREHOUSES AT

San Francisco - Los Angeles - Portland - Seattle

HERMAN T. LUDWIG
Building Construction
Phone Valencia 2539 636 Jessie Street, Near 7th, San Francisco

GEO. W. BOXTON & SON
General Contractors
Office, 1233 HEARST BUILDING SAN FRANCISCO, CAL.
Telephone Sutter 1601

Phone Kearny 381 J. M. Morrison F. H. Masow
MASOW & MORRISON
GENERAL CONTRACTORS
BUILDING CONSTRUCTION
518-522 Monadnock Bldg. San Francisco

Res. Mill Valley, Telephone Mill Valley 240 Member of General Contractors Association
HARVEY A. KLYCE
GENERAL BUILDING CONTRACTOR
408 New Call Building, SAN FRANCISCO Phone Douglas 3280

CHAS. A. WHITTON R. E. CHRISMAN J. M. DOUGAN
J. M. DOUGAN CO.
GENERAL CONTRACTORS
Telephone Sutter 4634 715-716 Hearst Building, SAN FRANCISCO

MacRORIE-McLAREN CO.
LANDSCAPE ENGINEERS and GENERAL NURSERYMEN
Office, 141 POWELL STREET, San Francisco
Nurseries at Beresford, San Mateo County

Phone Sutter 2581
LARSEN-SAMPSON CO.
BUILDING CONSTRUCTION
601 CROCKER BUILDING SAN FRANCISCO

Construction and Engineering Co.
(Incorporated)
GENERAL CONTRACTORS
Phone Sutter 4852 320 Market Street, San Francisco

Pioneer Shingle Stains

The most obvious advantage of specifying PIONEER SHINGLE STAINS as the stain for shingles and rough woodwork, is that they remain permanently attractive.

They are non-fading in color, since only pure colors ground in linseed oil are used to produce the great diversity of shades from which to make selection.

Warping, dry-rot and splitting of the wood is entirely eliminated by use in the stains of a high percentage of creosote as a preserving agent.

Maximum durability and lasting brilliancy are the qualities that make PIONEER SHINGLE STAINS the ones best suited to decorate and preserve all shingled roofs and rough woodwork

W. P. Fuller & Co.

Specialized Paint and Varnish Products For Every Purpose

THE ARCHITECT AND ENGINEER OF CALIFORNIA

AUGUST, 1917 VOL. L. No. 2

PVBLISHED IN SAN FRANCISCO ·
25 CENTS A COPY · ONE DOLLAR AND A HALF A YEAR

S. F. CITY HALL
Bakewell & Brown,
Architects

SANTA FE BLDG.
Wood & Simpson,
Architects

SOUTHERN PACIFIC
BLDG., Bliss & Faville,
Architects

HOBART BLDG.
Willis Polk & Co.
Architects

"Pacific" Plumbing Fixtures were installed throughout San Francisco's largest and most important buildings, because their architects wished to have plumbing fixtures installed that would be of the same high quality as the other equipment.

"Pacific"

PLUMBING FIXTURES

FOR SALE BY ALL JOBBERS

Main Office and Showroom,
67 New Montgomery St.,
San Francisco, California

Factories,
Richmond and
San Pablo, California

All the Windows

IN

HUMPHREY APARTMENTS

Hyde and Chestnut Streets, San Francisco

C. A. MEUSSDORFFER, Architect

ARE

HAUSER Reversible

HAUSER WINDOWS embody all the latest ideas and improvements in Casement, Vertical Hung and Double Acting Windows. They are water-tight, dust-proof and most easily operated. The U. S. District Court recently decided that the **HAUSER REVERSIBLE WINDOW** is in **a class by itself.**

Hauser Reversible Window Co.

Phone Kearny 3706 **157 MINNA ST., SAN FRANCISCO**

For Modern Store-Fronts

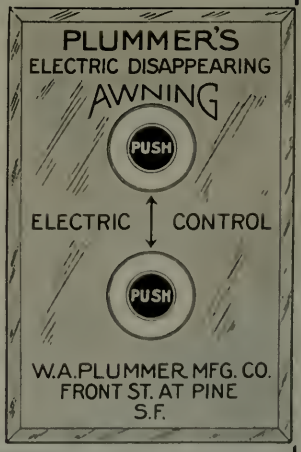
Our Disappearing AWNINGS

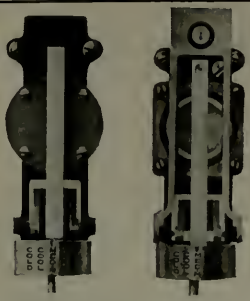
are constructed with no outside attachments below recess, above windows gears entirely concealed.

Absolutely practicable when extended and when rolled up is contained in recess 8" x 8½", with front board, which can be utilized as a sign board, covering front of recess. Operated either by crank or electric control, from any part of building.

Send for Architect's Sheet of Specifications.

The new Southern Pacific Building, San Francisco, is being equipped with **Plummer's Disappearing Awnings**





The Above Types of THERMOSTATS for VENTILATION and DIRECT RADIATION Respectively, are less than five inches long and represent

"THE LAST WORD IN TEMPERATURE REGULATION"

Write us about them

JOHNSON SERVICE CO.

800 Chamber of Commerce Bldg., Portland, Ore
1104 White Building, Seattle, Wash.
604 Citizens Bank Bldg., Los Angeles, Cal.
149 FIFTH ST., SAN FRANCISCO, CAL.

THE PERFECTION DISAPPEARING BEDS

The Last Word in Efficiency, Simplicity and Adaptability

Full Line of Oscillating Beds, Disappearing Beds, Recess Beds, Wall Beds

PERFECTION DISAPPEARING BED CO.

Telephone Sutter 3367

739 Mission Street, San Francisco

THE HYLOPLATE BLACKBOARD

SCHOOL FURNITURE
Auditorium Seating

MAPS
GLOBES
ATLASES

C. F. WEBER & CO.

365 Market Street
SAN FRANCISCO

222-224
S. Los Angeles St.
LOS ANGELES

100 W. Commercial
Row, RENO, NEV.

124 W. Washington
Street, PHOENIX, ARIZ.

KEYHOLD LATH

(*Made in California*)

A GYPSUM and magnesite plaster board with the perfect mechanical key, complying with the ordinance in building laws—non-conductor of sound, heat and electricity. Saves in time and expense over metal lath construction. We give specifications, demonstrations and figure partitions, ceilings and wall furring, in class "A," "B" and "C" buildings, and exterior stucco jobs, furnishing the only plaster-board known in lengths up to 12 feet, eliminating horizontal joints.

See our display at Building Material Exhibit, 77 O'Farrell street, showing Keyhold Lath "Standard," "Fireproofed," "Waterproofed" and "Wall Board."

KEYHOLD LATH COMPANY

Manufacturer's Distributors for

SCHUMACHER WALL BOARD COMPANY

251-255 Monadnock Building, San Francisco. 'Phone Douglas 3472.

KOHLER WARE

"Viceroy Bath"—Plate V-14
(Patent Applied For and Name Reg. U. S. Pat. Off.)

"Revel" Lavatory
Plate F-271-I

★
The stars indicate location of the KOHLER permanent trade-mark in faint blue

Your Specifications

should include plumbing ware for bathrooms and kitchens that will retain its attractiveness for a lifetime.

KOHLER WARE

always of one quality—the highest

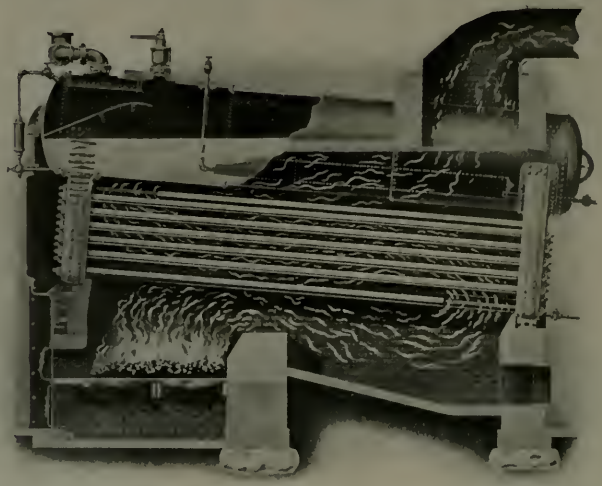
Insure the permanent satisfaction of your client by specifying KOHLER Bath Tubs, Lavatories and Sinks. KOHLER WARE is notable for its superior quality, the beauty of the enamel, and the hygienic designs.

KOHLER CO., *Founded 1873* Kohler, Wis.

Boston New York Philadelphia Pittsburgh Atlanta
Detroit Indianapolis Chicago St. Paul St. Louis
Houston San Francisco Los Angeles
Seattle London

The FRANKLIN Water-Tube Boiler

COMPLYING WITH THE CALIFORNIA CODE



DESCRIPTION

Your Attention Invited

Safety Under High Pressure through proper choice of materials.

Unimpeded Circulation through correct design.

High Furnace Temperature, resulting in complete combustion.

Heating Surface properly disposed to absorb heat.

Easy Cleaning and Inspection from outside front and rear.

Hand-Hole Plate Joints tightened by internal pressure.

Method of Support, ideal for contraction and expansion.

Many Other Meritorious Features

INSTALLATIONS

YOUR INSPECTION INVITED

Y. M. C. A. Building, S. F.	3—104 H.P.	312 H.P.
St. Luke's Hospital, S.F.	2—150 H.P.	300 H.P.
St. Mary's Hospital, S. F.	2—135 H.P.	270 H.P.
University of Cal. Hospital, S. F.	2—165 H.P.	330 H.P.
Examiner Building, S. F.	2—119 H.P.	238 H.P.
Whitney Building, S. F.	2—143 H.P.	286 H.P.
Hotel Del Monte, Monterey	1—220 H.P.	220 H.P.
Shattuck Hotel, Berkeley	2— 90 H.P.	180 H.P.
Cal. Paper & Bd. Mills, Antioch	2—270 H.P.	540 H.P.
Cal. Paper & Bd. Mills, Antioch	3—190 H.P.	570 H.P.
Western Meat Co., S. F.	2—104 H.P.	208 H.P.
Oakland Meat Co., Oakland	1—143 H.P.	143 H.P.
Belmont School, Belmont	1—104 H.P.	104 H.P.
St. Joseph's Home	2—104 H.P.	208 H.P.
D. Ghiradelli & Co., S. F.	1—152 H.P.	152 H.P.
Rialto Bldg., S. F.	1—135 H.P.	135 H.P.
Fairmont Hotel, S. F.	2—104 H.P.	208 H.P.
Total		4404 H.P.

Send for Catalog "E"

SELLING AGENTS

GENERAL MACHINERY & SUPPLY CO.

39-51 Stevenson Street, San Francisco, Cal.

House at Cornwall-on-Hudson, N. Y. Finished with Old Virginia White. Rogers & Zogbaum, Architects, New York

Cabot's Old Virginia White

A Soft, Brilliant White for Shingles, Siding and Similar Woodwork. As Bright and Clean as New Whitewash, and as Lasting as Paint.

Architects and others have tried for years to get a paint that would give the same beautiful, brilliant white as new whitewash, and would also be durable and clean and not rub off like whitewash. But paint was always "painty" — hard, cold and heavy. Old Virginia White is a shingle-stain compound that has solved the problem. It is as clean, cool and brilliant as fresh whitewash, and as lasting as paint; but it is not messy like whitewash, nor painty like paint, although it costs less and goes farther than paint.

Send for Sample Shingle and Circular showing other fine houses finished with Old Virginia White

SAMUEL CABOT, Inc., Mfg. Chemists, Boston, Mass.

Cabot's Creosote Stains, Stucco and Brick Stains, "Quilt," Mortar Colors, Dampproofing, Waterproofings, Conservo Wood Preservative, etc.

Pacific Building Materials Co., San Francisco
Mathews Paint Company, Los Angeles
S. W. R. Daily, Seattle
Timms, Cress & Co., Portland

COURTEOUS CONTINUOUS PACIFIC GAS AND ELECTRIC COMPANY RELIABLE

GAS IS THE CLEANEST AND

MOST EFFICIENT FUEL

A MATCH AND

"PACIFIC SERVICE"

WILL GIVE YOU

CONTINUOUS SERVICE

Pacific Gas and Electric Company

San Francisco District
445 Sutter Street, San Francisco, Cal.

RAYMOND GRANITE COMPANY

Incorporated

Owning and operating at Knowles, Madera County, the largest Quarry in the world.

CONTRACTORS FOR STONE WORK

OF EVERY DESCRIPTION

Designers and Manufacturers of Exclusive Monuments and Mausoleums.

Main Office and Yard:

Number 1 and 3 Potrero Avenue, - SAN FRANCISCO, CALIFORNIA.

Also at Number 612-614 Homer Laughlin Building, Los Angeles.

SARATOGA CRUSHED ROCK COMPANY

CONCRETE ROCK AND CLEAN SHARP SAND

CRUSHED, WASHED, AND SCREENED, AND IN ANY AGGREGATE DESIRED.

SPECIALLY PREPARED SELF-BINDING ROCK FOR ROADS, WALKS AND DRIVEWAYS

Low freight rates to Los Altos, Palo Alto, and all points on Peninsular Railway.
The quarry is equipped with one of the most modern plants.
Large production—Excellent railroad facilities—Good service assured.

Quarry: Saratoga, Santa Clara Co.

BAKER-MACDONALD CO., Managers
703 First National Bank Building, SAN JOSE. Phone S.J.4620

S. F. Metal Stamping Works

THEOPHILE LAHAYE

ORNAMENTAL and PLAIN
Stamped, Spun, Hammered and Cast METAL

2269 FOLSOM ST. Phone Mission 2421 SAN FRANCISCO

Architects' Specification Index

(For Index to Advertisements, see next page)

ACOUSTICAL CORRECTION

H. W. Johns-Manville Co., Second and Howard Sts., San Francisco.

ARCHITECTURAL SCULPTORS, MODELING, ETC.

G. Rognier & Co., 233 R. R. Ave., San Mateo.
A. F. Swoboda, modeler, 204 Second St., San Francisco.

ARCHITECTURAL TERRA COTTA

Gladding, McBean & Company, Crocker Bldg., San Francisco.

ASBESTOS ROOFING

H. W. Johns-Manville Company, San Francisco, Los Angeles, San Diego, Sacramento.

AUTOMATIC SPRINKLERS

Scott Company, 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

AWNINGS

W. A. Plummer Mfg. Co., Pine and Front Sts., San Francisco.

BANK FIXTURES AND INTERIORS

Fink & Schindler, 218 13th St., San Francisco.
A. J. Forbes & Son., 1530 Filbert St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco.
Home Mfg. Co., 543 Brannan St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
Mullen Manufacturing Co., 20th and Harrison Sts., San Francisco.

BLACKBOARDS

C. F. Weber & Co., 365 Market St., San Francisco.
Beaver Blackboards and Greenboards, Rucker-Fuller Desk Company, Coast agents, 677 Mission St., San Francisco, Oakland and Los Angeles.

BOOK BINDERS AND PRINTERS

Hicks-Judd Company, 51-65 First St., San Francisco.

BOILERS

"Franklin" water tube boiler, sold by General Machinery and Supply Co., 37 Stevenson St., San Francisco.
"Kewanee," boiler sold by California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.

BRASS GOODS, CASTINGS, ETC.

H. Mueller Manufacturing Co., 589 Mission St., San Francisco.

BRICK—PRESSED, PAVING, ETC.

Gladding, McBean & Company, Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Livermore Brick Company, pressed, glazed and enameled, etc., Livermore, Cal.
United Materials Co., Crossley Bldg., San Francisco.
California Brick Company, Niles, Cal.

BRICK AND CEMENT COATING

Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.
Wadsworth, Howland & Co., Inc. (See Adv. for Pacific Coast Agents.)
Paraffine Paint Co., 34 First St., San Francisco.
R. N. Nason & Co., 151 Potrero Ave., San Francisco.

BRICK STAINS

Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

BUILDERS' HARDWARE

Bennett Bros., agents for Sargent Hardware, 514 Market St., San Francisco.
Pacific Hardware & Steel Company, San Francisco, Oakland, Berkeley, and Los Angeles.

BUILDING MATERIAL, SUPPLIES, ETC.

Pacific Building Materials Co., 523 Market St., San Francisco.
C. Jorgensen, Crossley Bldg., San Francisco.
Richard Spencer, Hearst Bldg., San Francisco.
The Howard Company, First and Market Sts., Oakland.
James P. Dwan, 1113 Hearst Bldg., San Francisco.

CEMENT

Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market street, San Francisco.
"Golden Gate" Brand, manufactured by Pacific Portland Cement Co., Pacific building, San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT

Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See distributing agents in advertisement.)
Armorite, sold by W. P. Fuller & Co., all principal Coast cities.
Imperial Waterproofing, manufactured by Imperial Co., 183 Stevenson St., San Francisco.
Paraffine Paint Co., 34 First St., San Francisco.

CEMENT EXTERIOR FINISH

Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co., (See list of Distributing Agents in adv.)
Concreta, sold by W. P. Fuller & Co., all principal Coast cities.

"GRANT CONCRETE MIX" The only properly proportioned mix in this market. Composed of hard, clean, fresh-water gravel, free from sand stone, and contains about 25% of crushed rock and necessary amount of sand.

WE GUARANTEE LESS THAN 25% VOIDS.

Used on many important first-class buildings and road work. Accepted on all City, State and U. S. Government work.

GRANT GRAVEL COMPANY

PLATIRON BLDG., Phone Sutter 1582, SAN FRANCISCO

An Index to the Advertisements

	Page
American Art Metal Works	127
American Mail Chute	30
American Marble & Mosaic Co.	36
American Rolling Mill	125
American Standard Oil Burner	144
Arlett, Arthur	148
Asbestos Protected Metal Co.	117
Atlas Heating & Ventilating Co.	128
Austin Cube Mixer	141
Aylsworth Agencies Co	13
Bacon, Ed. R	118
Baker-MacDonald Co	6
Barrett & Hilp	128
Bass-Hueter Co. 3rd Cover	
Bennett Bros	145
Bergren & Son, L. G	123
Berry Bros	19
Bigley, Albert S	30
Biturine Company	36
Boggs, Fred H	147
Bos, Geo. A	149
Bowser & Co., S. F	131
Boxton & Son, Geo. W	151
Brady, A. P	31
Brininstool Co	22
Building Material Exhibit	26
Burlington Venetian Blind Co.	34
Butte Engineering Co	115
Buttonlath	20
Cabot, Samuel (Inc.)	5
California Artistic Metal and Wire Co	32
California Brick Co	19
California Bldg. Material Co.	141
California Granite Co	145
California Hydraulic Engineering and Supply Co	123
California Photo Engraving Co.	144
California Plumbing Supply Co.	18
Cannon-Phillips Co	118
Capitol Sheet Metal Works	142
Carnahan & Mulford	145
Central Iron Works	32
Channing, John	129
Childs, Neil T	124
City of Paris	147
Coleman, Alex	138
Colorado-Yule Marble Co	129
Concrete Engineering Co	147
Cook Belting Co	27
Costello, J. T. Co	147
Courtney, G. W	123
Cowell Lime & Cement Co	141
Crane Co	3
Crowe, J. B	123
Cutler Mail Chute Co	30
Denison Block Co	138
Dieckmann Hardwood Co	120
Dioguardi & Terranova	128
Dolan Wrecking ane Construction Co	128
Dudfield Lumber Co	15
Duncan, W. C	144
Dunham, C. A., Co	35
Dunn, Neil H	123
Dwan, Jos. P	117
Dyer Bros	22
Eaton, W. L	11
Elam & Son	145
Ellery Arms Co	134
Fair Manufacturing Company	32
Falvy, A	34
Farrell & Reed	146
Fess System Co	34
Fick Bros	136
Fidelity & Casualty Co. of N.Y.	147
Fidelity & Deposit Co of Maryland	147
Fink & Schindler Co., The	142
Fish Fuel System	136
Flagg, Edwin H., Scenic Co	145
Forbes & Son	134
Foster Vogt Co	146
Foxcroft Bldg	132
Fuller, W. P. Co	152
General Gas Light Co	24
General Machin'ry & Supply Co.	4
Germanwood Floor Co	123
Gilley-Schmid Co	144
Gladding, McBean & Co	6
Glauber Brass Mfg. Co	18
Glebe Indemnity Co	147
Goldberg, Bowen & Co	140
Golden Gate Decorating Co	134
Golden Gate Ornamental Iron Co	32
Goodyear Rubber Co	25
Goold & Johns	117
Grant Gravel Co	7
Grant Rock & Gravel Co	146
Haines, Jones & Cadbury	128
Hammond, M. E	143
Hannah, J. D	149
Hauser Reversible Window	1
Hicks-Judd Co	136
Hillard, C. J., Co	33
Hipolito Screen Co	34
Holbroo's, Merrill & Stetson	126
Home Mfg. Co	145
Hooper Lumber Co	35
Hoosier Cabinets	142
Houghton Construction Co	149
Howard Company	123
Hughson & Merrill	144
Hunt, Robt. W. & Co	141
Hunter & Hudson	133
Hurley Co., J. C	142
Ideal Heating Co	117
Illinois Engineering Co	35
Imperial Waterproofing Co	23
Improved Sanitary Fixture Co	23
Jackson Sidewalk Lights	14
James & Drucker	133
Jarvis, T. P	35
Johns-Manville Co	23
Johnson, S. T	132
Johnson Service Co	2
Jorgensen, C	117
Judson Mfg. Co	31
Key-Hold Lath Co	2
Kinnear Mfg. Co	36
Kissel, I. R	142
Klyce, Harvey A	151
Knowles & Mathewson	146
Kohler Co	3
Lachman Wall Bed Co	16
Lange & Bergstrom	148
Larsen & Bro	128
Larsen, Sampson & Co	151
Lawton & Vezey	146
Lettich, A	146
Livermore Fire Brick Works	19
Los Angeles Pressed Brick Co.	29
Ludwig, H. T	151
MacGruer & Co	142
Magner Bros	134
Mark-Lally Co	133
Masow & Morrison	151
Mangrum & Otter	138
Marshall & Stearns Co	22
Master Builders	120
McClenahan, S. P	143
McElhinney Tile Co	12
McGilvray Stone Co	133
MacRorie-McLaren Co	151
Meese & Gottfried	124
Miller-Enwright Co	146
Modern Appliance Co	140
Monk, John	143
Monson Bros	149
Montague, P	149
Morehouse, C. C	148
Mortenson Construction Co	32
Mott Iron Works	18
Mullen Mfg. Co	117
Mueller, H. Mfg. Co	133
Municipal Engineering Co	141
Musto Sons Keenan Co	13
Nason, R. N. & Co	12
Nathan, Dohrmann Co	144
National Mill & Lumber Co	17
National Surety Co	134
Ne Page, McKenny Co	117
Newbery Electric Co	117
New York Belting Co	119
Niles Sand Gravel & Rock Co.	36
Norris Co., L. A	140
O'Hara & Livermore	143
Oak Flooring Service Bureau.	25
Otis Elevator Co. Back Cover	
Owsley, B. T	142
Pacific Building Materials Co.	31
Pacific Coast Paint Corp'n	140
Pacific Coast Steel Company	27
Pacific Fire Extinguisher Co	115
Pacific Gas & Electric Co	5
Pacific Hardware and Steel Co.	144
Pacific Imp. Co	17
Pacific Mfg. Co	145
Pacific Porcelain Ware Co. 2d Cover	
Pacific Rolling Mills	33
Palm Iron Works	31
Palmer & Petersen	149
Paraffine Paint Co. Back Cover	
Perfection Disappearing Bed Co	2
Parry, Geo. H	135
Patent Vulcanite Roofing Co.	28
Phillips, Chas. T	124
Phoenix Sidewalk Light Co	9
Pioneer Paper Co	9
Pitcher Door Hanger	17
Pittsburg Water Heater	131
Plummer, W. A. Mfg. Co	1
Pope & Talbot	138
Portland Lumber Co	15
Pratt Building Material Co	130
Prometheus Electric Co	143
Ralston Iron Works	33
Ray, W. S. Mfg. Co. Inc	27
Raymond Granite Co	6
Reliance Ball-Bearing Door Hanger	127
Rigney Tile Co	134
Rix Compressed Air Co	23
Roberts Mfg. Co	115
Robertson & Hall	147
Rognier & Co	24
Rucker-Fuller Desk Co	129
S. F. Metal Stamping Works	6
S. F. Pioneer Varnish Wks. 3d Cover	
Saratoga Rock Co	6
Schaw-Batcher Co	21
Scott Co	128
Schreiber & Sons Co	30
Schrader Iron Works	32
Sierra Electric Constr. Co	137
Simonds Machinery Co	134
Simpson & Stewart	34
Sloan Valve Co	18
Southern California Iron and Steel Co	32
Southern Pacific Co	132
Spencer Elevator Co	11
Spencer, Richard	146
Spencer Turbine Cleaner	144
St. Franeis Hotel	26
Standard Elec. Con. Co	115
Standard Varnish Co	139
Stevenson, Frank	151
Stockholm & Allyn	146
Sunset Lumber Company	15
Thermic Eng. Co	151
Tittle, H. S	134
Tormey Co	133
Trost, Robt	128
Uhl Bros	114
United Lumber Co	15
United Materials Co	29
U. S. Metal Products Co. 30,	138
U. S. Steel Products Co	150
Van Emon Elevator Co	136
Van Fleet-Freear Co	10
Vitrolite Construction Co	21
Vermont Marble Co	24
Wadsworth Howland	116
Ward, P. R	123
Walter, D. N. & E. & Co	10
Weber, C. F. & Co	2, 20
West Coast Wire & Iron Works	32
Western Blind & Screen Co.	20
Western Iron Works	33
Western Pacific	24
Western Vacuum Supply Co.	129
Whitcomb Hotel	132
White Bros	112
Williams Bros. & Henderson	148
Wilson, W. F., Co	142
Wold, C. L., Co	149
Woods, Huddart & Gunn	27
Zelinsky, D. & Sons	149

Roofing?
Don't take chances on inferior material. Buy the old reliable **Pioneer**
SPECIFY AND INSIST ON "PIONEER ROOFING"
PIONEER PAPER CO., Manufacturers 506-507 Hearst Bldg., San Francisco
Telephone Kearny 3788

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CEMENT EXTERIOR FINISH—continued
Pacific Building Materials Co., 523 Market St.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents in adv.)
Fuller's Concrete Floor Enamel, made by W. P. Fuller & Co., San Francisco.

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CHURCH INTERIORS
Fink & Schindler, 218 13th St., San Francisco.

CHUTES—SPIRAL
Haslett Warehouse Co., 310 California St., San Francisco.

COLD STORAGE PLANTS
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

COMPOSITION FLOORING
Germanwood Floor Co., 1621 Eddy St., San Francisco.
"Vitrolite," Vitrolite Construction Co., 34 Davis St., San Francisco.

COMPRESSED AIR MACHINERY
General Machinery & Supply Co., 39 Stevenson St., San Francisco.

COMPRESSED AIR CLEANERS
Spencer Turbine Cleaner. Sold by Hughson & Merton, 530 Golden Gate Ave., San Francisco.
Western Vacuum Supply Co., 1125 Market St., San Francisco.

CONCRETE CONSTRUCTION
Clinton Construction Co., 140 Townsend street, San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Palmer & Petersen, Monadnock Bldg., San Francisco.

CONCRETE HARDNER
Master Builders Method, represented in San Francisco by C. Roman, Sharon Bldg.

CONCRETE MIXERS
Austin Improved Cube Mixer. J. H. Hansen & Co., California agents, 508 Balboa Bldg., San Francisco.
Foote Mixers. Sold by Edw. R. Bacon, 40 Natoma St., San Francisco.

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Twisted Bars. Sold by Woods, Huddart & Gunn, 444 Market St., San Francisco.
Clinton Welded Wire Fabric, L. A. Norris Co., 140 Townsend St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Southern California Iron and Steel Company, Fourth and Mateo Sts., Los Angeles.
Triangle Mesh Fabric. Sales agents, Pacific Building Materials Co., 523 Market St., San Francisco.

CONCRETE SURFACING
"Concreta." Sold by W. P. Fuller & Co., San Francisco.
Wadsworth, Howland & Co.'s Bay State Brick and Cement Coating. Sold by Jas. Hambly & Sons, Pacific Bldg., San Francisco and Los Angeles.

CONTRACTOR'S BONDS
Bonding Company of America, Kohl Bldg., San Francisco.
Globe Indemnity Co., 120 Leidesdorff St., San Francisco.
Fred H. Boggs, Foxcroft Bldg., San Francisco.
National Surety Co. of N. Y., 105 Montgomery St., San Francisco.
Fidelity & Casualty Co. of New York, Merchants Exchange Bldg., San Francisco.
Fidelity & Deposit Co. of Maryland,, Insurance Exchange, San Francisco.
J. T. Costello Co., 216 Pine St., San Francisco.
Robertson & Hall, First National Bank Bldg., San Francisco.

CONTRACTORS, GENERAL
Arthur Arlett, New Call Bldg., San Francisco.
Farrell & Reed, Gunst Bldg., San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Carnahan & Mulford, 45 Kearny St., San Francisco.
Houghton Construction Co., Hooker & Lent Bldg., San Francisco.
Geo. H. Bos, Hearst Bldg., San Francisco.
Larsen, Sampson & Co., Crocker Bldg., San Francisco.
J. D. Hannah, 725 Chronicle Bldg., San Francisco.
Stockholm & Allyn, Monadnock Bldg., San Francisco.
B. T. Owsley, 180 Jessie St., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
Dioguardi & Terranova, Westbank Bldg., San Francisco.
L. G. Bergren & Son, Call Bldg., San Francisco.
Grace & Bernieri, Claus Spreckels Bldg., San Francisco.
Geo. W. Boxton & Son, Hearst Bldg., San Francisco.
W. C. Duncan & Co., 526 Sharon Bldg., San Francisco.
A. P. Brady, Humboldt Bank Bldg., San Francisco.
Harvey A. Klyce, New Call Bldg., San Francisco.
Knowles & Mathewson, Call Bldg., San Francisco.
C. L. Wold Co., 75 Sutter St., San Francisco.
P. R. Ward, 981 Guerrero St., San Francisco.
Lange & Bergstrom, Sharon Bldg., San Francisco.
Foster Vogt Co., 411 Sharon Bldg., San Francisco.
T. B. Gnodwin, 110 Jessie St., San Francisco.
Thos. Elam & Son, Builders Exchange, San Francisco.
Masow & Morrison, 518 Monadnock Bldg., San Francisco.
Lawton & Vezey, 206 Plaza Bldg., Oakland.

PHŒNIX SIDEWALK LIGHTS
ARE INSTALLED at the Santa Fe Building,
Second and Market Streets, San Francisco
PHŒNIX SIDEWALK LIGHT CO.
472 Monadnock Building, SAN FRANCISCO Telephone Douglas 3111

MAS-OLEUM FLOORING (A Mastic Linoleum)
DUSTLESS, SEAMLESS, WATERPROOF, ACID and ALKALI PROOF
VAN FLEET - FREEAR COMPANY, Agents
Telephone Douglas 1227 120 JESSIE STREET, SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONTRACTORS, GENERAL—Continued
Monson Bros., 502 Clunie Bldg., San Francisco.
Palmer & Peterson, Monadnock Bldg., San Francisco.
Robert Trost, Twenty-sixth and Howard Sts., San Francisco.
John Monk, Sheldon Bldg., San Francisco.
Williams Bros. & Henderson, 381 Tenth St., San Francisco.

CONVEYING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CORK TILING, FLOORING, ETC.
David Kennedy, Inc., Sharon Bldg., San Francisco.
Bevver Cork Tile. Sold by W. L. Eaton & Co., 812 Santa Marina Bldg., San Francisco.

CORNER BEAD
Capitol Art Metal Works, 1927 Market St., San Francisco.
United States Metal Products Co., 555 Tenth St., San Francisco; 750 Keller St., San Francisco.

CORK TILE AND INSULATION
Van Fleet-Freear Co., 120 Jessie St., San Francisco.

CRUSHED ROCK
Grant Gravel Co., Flatiron Bldg., San Francisco.
California Building Material Company, new Call Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., San Francisco.
Pratt Building Material Co., Hearst Bldg., San Francisco.
Saratoga Rock Company, Baker-MacDonald Co. representatives, First National Bank Bldg., San Jose.

DAMP-PROOFING COMPOUND
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Biturine Co., 24 California St., San Francisco.
Imperial Co., 183 Stevenson St., San Francisco.
"Fabco" Damp-Proofing Compound, sold by Paraffine Paint Co., 34 First St., San Francisco.
Wadsworth, Howland & Co., Inc., 84 Washington St., Boston. (See Adv. for Coast agencies.)

DOOR HANGERS
McCabe Hanger Mfg. Co., New York, N. Y.
Pitcher Hanger, sold by National Lumber Co., 326 Market St., San Francisco.
Reliance Hanger, sold by Sartorius Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Columbia Wire & Iron Works, Portland, Ore.

DRAIN BOARDS, SINK BACKS, ETC.
Germanwood Floor Co., 1621 Eddy St., San Francisco.

DRINKING FOUNTAINS
Haws Sanitary Fountain, 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.

DRINKING FOUNTAINS—Continued
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 173 Beale St., San Francisco.
M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELECTRICAL CONTRACTORS
Butte Engineering Co., 683 Howard St., San Francisco.
Goold & Johns, 113 S. California St., Stockton, Cal.
NePage, McKenny Co., 149 New Montgomery St., San Francisco.
Newbery Electrical Co., 413 Lick Bldg., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
H. S. Tittle, 245 Minna St., San Francisco.
Standard Electrical Construction Company, 60 Natoma St., San Francisco.

ELECTRICAL ENGINEERS
Chas. T. Phillips, Pacific Bldg., San Francisco.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 126 Beale St., San Francisco.
Van Emon Elevator Co., 54 Natoma St., San Francisco.

ENGINEERS
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

FIRE ESCAPES
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE EXTINGUISHERS
Scott Company, 243 Minna St., San Francisco
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

FIREPROOFING AND PARTITIONS
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

FIXTURES—BANK, OFFICE, STORE, ETC.
T. H. Meek & Co., 1130 Mission St., San Francisco.
Mullen Manufacturing Co., 20th and Harrison Sts., San Francisco.
The Fink & Schindler Co., 218 13th St., San Francisco.
A. J. Forbes & Son, 1530 Filbert St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

D. N. & E. WALTER & CO.
"SINCE 1858"
LINOLEUMS—CARPETS LARGE STOCKS CARRIED
Estimates furnished on request
100 STOCKTON STREET SAN FRANCISCO

"BE-VER" CORK TILING

Artistic = Quiet = Durable

MADE IN A WIDE RANGE OF COLORS — MODERATE IN PRICE.

W. L. EATON & CO., Agents

112 Market St., San Francisco Telephone Garfield 372

See sample installation at The Building Material Exhibit, 77 O'Farrell Street

ARCHITECTS' SPECIFICATION INDEX—*Continued*

FLOOR TILE
New York Belting and Packing Company, 519 Mission St., San Francisco.
W. L. Eaton & Co., 112 Market St., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
R. N. Nason & Co., San Francisco and Los Angeles.

FLOORS—COMPOSITION
"Vitrolite," for any structure, room or bath. Vitrolite Construction Co., 1490 Mission St., San Francisco.
Germanwood Floor Co., 1621 Eddy St., San Francisco.

FLOORS—HARDWOOD
Oak Flooring Bureau, Conway Bldg., Chicago, Ill.
Strable Mfg. Co., 511 First St., Oakland.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.

FURNACES—WARM AIR
Miller-Enwright Co., 907 Front St., Sacramento.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co., 612 Howard St., San Francisco.
Rix Compressed Air and Drill Company, First and Howard Sts., San Francisco.

GARBAGE CHUTES
Bradshaw Sanitary Garbage Chute, Aylsworth Agencies Co., 591 Mission St., San Francisco, sole agents for California.

GAS GRATES
General Gas Light Co., 768 Mission St., San Francisco.

GLASS
W. P. Fuller & Company, all principal Coast cities.
Whittier, Coburn Co., Howard and Beale Sts., San Francisco.

GRADING, WRECKING, ETC.
P. Montague Co., 110 Jessie St., San Francisco.
Dolan Wrecking & Construction Co., 1607 Market St., San Francisco

GRANITE
California Granite Co., Sharon Bldg., San Francisco.
McGilvray-Raymond Granite Co., 634 Townsend St., San Francisco.
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.

GRAVEL AND SAND
California Building Material Co., new Call Bldg., San Francisco.
Del Monte White Sand, sold by Pacific Improvement Co., Crocker Bldg., San Francisco.

GRAVEL AND SAND—Continued
Pratt Building Material Co., Hearst Bldg., San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
Grant Rock & Gravel Co., Cory Bldg., Fresno.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., 704 Market St., San Francisco.
Saratoga Rock Company, 703 First National Bank Bldg., San Jose.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.
Empire Plaster sold by Pacific Portland Cement Co., Pacific Bldg., San Francisco.

HARDWARE
Pacific Hardware & Steel Company, representing Lockwood Hardware Co., San Francisco.
Sargent's Hardware, sold by Bennett Bros., 514 Market St., San Francisco.

HARDWOOD LUMBER—FLOORING, ETC.
Dieckmann Hardwood Co., Beach and Taylor Sts., San Francisco.
Parrott & Co., 320 California St., San Francisco.
White Bros., cor. Fifth and Brannan Sts., San Francisco.
Strable Mfg. Co., 511 First St., Oakland.

HEATERS—AUTOMATIC
Pittsburg Water Heater Co., 478 Sutter St., San Francisco.

HEATING AND VENTILATING
Gilley-Schmid Company, 198 Otis St., San Francisco.
Mangrum & Otter, Inc., 507 Mission St., San Francisco.
Charles T. Phillips, Pacific Bldg., San Francisco.
James & Drucker, 450 Hayes St., San Francisco.
J. C. Hurley Co., 509 Sixth St., San Francisco.
Illinois Engineering Co., 563 Pacific Bldg., San Francisco.
Neil H. Dunn, 786 Ellis St., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
Scott Company, 243 Minna St., San Francisco.
C. A. Dunham Co., Wells Fargo Bldg., San Francisco.

HEAT REGULATION
Johnson Service Company, 149 Fifth St., San Francisco.

HOLLOW BLOCKS
Denison Hollow Interlocking Blocks. Cannon-Phillips Co., Forum Bldg., Sacramento, and the Howard Company, Oakland.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.
Pratt Building Material Co., Hearst Bldg., San Francisco.

MADE IN SAN FRANCISCO

PASSENGER and FREIGHT ELEVATORS

INVESTIGATE OUR PRODUCT

SPENCER ELEVATOR COMPANY

126-128 Beale Street, SAN FRANCISCO Phone Kearny 664

McELHINNEY TILE CO.

Contractors for

FLOOR, WALL AND MANTEL TILE

1097 Mission Street, San Francisco — Park 6986

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HOLLOW METAL DOORS AND TRIM
- Edwin C. Dehn, 525 Hearst Bldg., San Francisco, representing Interior Metal Mfg. Co., and Dahlstrom Metallic Door Company, Jamestown, N. Y.

HOSPITAL EQUIPMENT
- Sierra Electric Construction Company.

HOSPITAL FIXTURES
- J. L. Mott Iron Works, 135 Kearny St., San Francisco.

HOTELS
- St. Francis Hotel, Union Square, San Francisco
- Hotel Whitcomb, facing Civic Center, San Francisco.

INGOT IRON
- "Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and Monadnock Bldg., San Francisco.

INSPECTIONS AND TESTS
- Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INTERIOR DECORATORS
- Mrs. H. C. McAfee, 504 Sutter St., San Francisco.
- Albert S. Bigley, 344 Geary St., San Francisco.
- City of Paris, Geary and Stockton Sts., San Francisco.
- A. Falvy, 578 Sutter St., San Francisco.
- The Tormey Co., 681 Geary St., San Francisco.
- Fick Bros., 475 Haight St., San Francisco.
- O'Hara & Livermore, Sutter St., San Francisco.

KITCHEN CABINETS
- Western Equipment Co., Building Material Exhibit, 77 O'Farrell St., San Francisco.
- Hoosier Cabinets, branch 1067 Market St., San Francisco.

LANDSCAPE ARCHITECTS
- Neil T. Childs Co., 68 Post St., San Francisco.

LAMP POSTS, ELECTROLIERS, ETC.
- J. L. Mott Iron Works, 135 Kearny St., San Francisco.
- Ralston Iron Works, 20th and Indiana Sts., San Francisco.

LANDSCAPE GARDENERS
- MacRorie-McLaren Co., 141 Powell St., San Francisco.

LATHING MATERIAL
- "Buttonlath," manufactured by Buttonlath Mfg. Co., office, Building Material Exhibit, San Francisco.
- Keyhold Lath Co., 251 Monadnock Bldg., San Francisco.
- Pacific Building Materials Co., 523 Market St., San Francisco.

LIGHT, HEAT AND POWER
- Pacific Gas & Elec. Co., 445 Sutter St., San Francisco.
- The Fish Fuel System, 50 Eighth St., San Francisco.

LIME
- Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
- D. N. & E. Walter & Co., O'Farrell and Stockton Sts., San Francisco.

LUMBER
- Dudfield Lumber Co., Palo Alto, Cal.
- Hooper Lumber Co., Seventeenth and Illinois Sts., San Francisco.
- Portland Lumber Co., 16 California St., San Francisco.
- Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
- Pope & Talbot, foot of Third St., San Francisco.
- Sunset Lumber Co., Oakland, Cal.
- United Lumber Company, 687 Market St., San Francisco.

MAIL CHUTES
- Cutler Mail Chute Co., Rochester, N. Y. (See adv. on page 30 for Coast representatives.)
- American Mailing Device Corp., represented on Pacific Coast by U. S. Metal Products Co., 555 Tenth St., San Francisco.

MANTELS
- Mangrum & Otter, 561 Mission St., San Francisco.

MARBLE
- American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
- Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
- Sculptors' Workshop. S. Miletin & Co., 1705 Harrison St., San Francisco.
- Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.

METAL CEILINGS
- San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

METAL DOORS AND WINDOWS
- U. S. Metal Products Co., 555 Tenth St., San Francisco.
- Capitol Art Metal Works, 1927-1935 Market St., San Francisco.

METAL FURNITURE
- Capitol Art Metal Works, 1927-1935 Market St., San Francisco.
- Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
- Edwin C. Dehn, Manufacturer's Agent, Hearst Bldg., San Francisco.

MILL WORK
- Dudfield Lumber Co., Palo Alto, Cal.
- Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
- National Mill and Lumber Co., San Francisco and Oakland.
- The Fink & Schindler Co., 218 13th St., San Francisco.

OIL BURNERS
- American Standard Oil Burner Company, Seventh and Cedar Sts., Oakland.
- S. T. Johnson Co., 1337 Mission St., San Francisco.
- T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., San Francisco.
- Fess System, 220 Natoma St., San Francisco.
- W. S. Ray Mfg. Co., 218 Market St., San Francisco.

NASON'S OPAQUE FLAT FINISH A FLAT, WASHABLE OIL PAINT, made in soft Kalsomine tints—a practical article for WALLS, CEILINGS, Etc. Economical and Durable. Agency TAMM & NOLAN COMPANY'S high grade Varnishes and Finishes, made on the Pacific Coast to stand our climatic conditions.

R. N. NASON & CO., Paint Makers

151 Potrero Ave.—SAN FRANCISCO—54 Pine Street

PORTLAND
SEATTLE
LOS ANGELES

CLARENCE E. MUSTO. Pres. JOSEPH B. KEENAN. Vice-Pres. GUIDO J. MUSTO. Sec'y & Treas.

JOSEPH MUSTO SONS-KEENAN CO.

Phone Franklin —6365— MARBLE OFFICE AND MILLS: 535-565 North Point St., SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE
- American Art Metal Works, 13 Grace St., San Francisco.
- California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
- Fair Manufacturing Company, 617 Bryant St., San Francisco.
- Palm Iron & Bridge Works, Sacramento.
- Ralston Iron Works, 20th and Indiana Sts., San Francisco.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
- Schreiber & Sons Co., represented by Western Builders Supply Co., San Francisco.
- Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
- West Coast Wire & Iron Works, 861-863 Howard St., San Francisco.

PAINT FOR CEMENT
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.) (See adv. in this issue for Pacific Coast agents.)
- Fuller's Concreta for Cement, made by W. P. Fuller & Co., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
- Berry Bros., 250-256 First St., San Francisco.
- Biturine Company, 24 California St., San Francisco.
- Pacific Coast Paint Corp'n, Security Bank Bldg., Oakland.
- Paraffine Paint Co., 34 First St., San Francisco.
- Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.

PAINTING, TINTING, ETC.
- Art Wall Paper Co., 508 Ellis St., San Francisco
- Golden Gate Decorating Co., 704 Polk St., San Francisco.
- I. R. Kissel, 1747 Sacramento St., San Francisco.
- D. Zelinsky & Sons, San Francisco and Los Angeles.
- The Tormey Co., 681 Geary St., San Francisco.
- Fick Bros., 475 Haight St., San Francisco.

PAINTS, OILS, ETC.
- The Brininstool Co., Los Angeles, the Haslett Warehouse, 310 California St., San Francisco.
- Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco.
- Berry Bros., 250-256 First St., San Francisco.
- Biturine Co., 24 California St., San Francisco
- Pacific Coast Paint Corp'n, Security Bank Bldg., Oakland.
- Whittier, Coburn Co., Howard and Beale Sts., San Francisco.
- Magner Bros., 419-421 Jackson St., San Francisco.
- R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
- W. P. Fuller & Co., all principal Coast cities.
- Standard Varnish Works, 55 Stevenson St., San Francisco.

PANELS AND VENEER
- White Bros., Fifth and Brannan Sts., San Francisco.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA
- Gladding, McBean & Co., Crocker Bldg., San Francisco.

PLASTER CONTRACTORS
- C. C. Morehouse, Crocker Bldg., San Francisco.
- MacGruer & Co., 180 Jessie St., San Francisco.
- M. J. Terranova, Westbank Bldg., San Francisco.

PLASTER EXTERIORS
- Buttonlath, for exterior and interior plastering, Hearst Bldg., San Francisco.

PLUMBING CONTRACTORS
- Alex Coleman, 706 Ellis St., San Francisco.
- A. Lettich, 365 Fell St., San Francisco.
- Neil H. Dunn, 786 Ellis St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Scott Co., Inc., 243 Minna St., San Francisco.
- Wm. F. Wilson Co., 328 Mason St., San Francisco.

PLUMBING FIXTURES, MATERIALS, ETC.
- Crane Co., San Francisco and Oakland.
- California Steam Plumbing Supply Co., 671 Fifth St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Glauber Brass Manufacturing Company, 1107 Mission St., San Francisco.
- Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
- Improved Sanitary Fixture Co., 632 Metropolitan Bldg., Los Angeles.
- J. L. Mott Iron Works, D. H. Gulick, selling agent, 135 Kearny St., San Francisco.
- Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
- H. Mueller Manufacturing Co., Pacific Coast branch, 589 Mission St., San Francisco.
- Miller-Enwright Co., 907 Front St., Sacramento.
- Mark-Lally Co., 235 Second St., San Francisco, also Oakland, Fresno, San Jose and Stockton.
- Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
- Wm. F. Wilson Co., 328 Mason St., San Francisco.
- C. A. Dunham Co., Wells Fargo Bldg., San Francisco.
- Neil H. Dunn, 786 Ellis St., San Francisco.

POTTERY
- Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

POWER TRANSMITTING MACHINERY
- Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PUMPS
- Simmds Machinery Co., 117 New Montgomery St., San Francisco.

RADIATORS
- American Radiator Co., Second and Townsend Sts., San Francisco.

RAILROADS
- Southern Pacific Company, Flood Bldg., San Francisco.
- Western Pacific Company, Mills Bldg., San Francisco.

BRADSHAW
SANITARY GARBAGE CHUTE
For full particulars see
AYLSWORTH AGENCIES CO.
591 Mission St. San Francisco Tel., Douglas 4405

Jackson's Patent Sidewalk Lights and "No Leak" Sidewalk Doors
FIRST AND BEST
P. H. Jackson & Co. 237 - 247 FIRST ST., SAN FRANCISCO
Tel. Kearny 1959

ARCHITECTS' SPECIFICATION INDEX—*Continued*

REFRIGERATORS
McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton Sts., San Francisco.

REVERSIBLE WINDOWS
Hauser Reversible Window Company, Balboa Bldg., San Francisco.
Whitney Windows, represented by Richard Spencer, 801-3 Hearst Bldg., San Francisco.

REVOLVING DOORS
Van Kennel Doors, sold by U. S. Metal Products Co., 525 Market St., San Francisco.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
C. F. Weber & Co., 365 Market St., S. F.
Kinnear Steel Rolling Door Co., Rialto Bldg., San Francisco.
Wilson's Steel Rolling Doors, U. S. Metal Products Co., San Francisco and Los Angeles.

ROOFING AND ROOFING MATERIALS
Asbestos Protected Metal Company, Hobart Building, San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
H. W. Johns-Manville Co., Second and Howard Sts., San Francisco.
Niles Sand, Gravel and Rock Co., Mutual Bank Bldg., San Francisco.
"Malthoid" and "Ruberoid," manufactured by Paraffine Paint Co., San Francisco.
Pioneer Roofing, manufactured by Pioneer Paper Co., 513 Hearst Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.
Vulcanite Products—Vulcanite ornamental roofings and Vulcanite roofing shingles, sold by Patent Vulcanite Roofing Co., 16th and Texas Sts., San Francisco.

RUBBER TILING
Goodyear Rubber Company, 587 Market St., San Francisco.
New York Belting & Rubber Company, 519 Mission St., San Francisco.

SAFETY TREADS
"Sanitread," sold by Richard Spencer, 801-3 Hearst Bldg., San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.
C. Jorgensen, Crossley Bldg., San Francisco.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co., 365 Market St., San Francisco; 512 S. Broadway, Los Angeles.
Rucker-Fuller Desk Company, 677 Mission St., San Francisco.

SCREENS
Hipolito Flyout Screens, sold by Simpson & Stewart, Dalziel Bldg., Oakland.
Watson Metal Frame Screens, sold by Richard Spencer, 801-3 Hearst Bldg., San Francisco.

SEEDS
California Seed Company, 151 Market St., San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Paraffine Paint Co., 34 First St., San Francisco.

SHEET METAL WORK, SKYLIGHTS, ETC.
Capitol Sheet Metal Works, 1927 Market St., San Francisco.
U. S. Metal Products Co., 555 Tenth St., San Francisco.

SHINGLE STAINS
Cabot's Creosote Stains, sold by Pacific Building Materials Co., Underwood Bldg., San Francisco
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SIDEWALK LIGHTS
P. H. Jackson & Co., 237-47 First St., San Francisco.
Jas. P. Dwan, Hearst Bldg., San Francisco.
Phoenix Sidewalk Light Co., 472 Monadnock Bldg., San Francisco.

STEEL TANKS, PIPE, ETC.
Schaw-Batcher Co. Pipe Works, 356 Market St., San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Dyer Bros., 17th and Kansas Sts., San Francisco.
Golden Gate Iron Works, 1541 Howard St., San Francisco.
Judson Manufacturing Co., 819 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Southern California Iron and Steel Co., Fourth and Mateo Sts., Los Angeles.
Western Iron Works, 141 Beale St., San Francisco.

STEEL PRESERVATIVES
Bay State Steel Protective Coating, manufactured by Wadsworth, Howland Co. (See adv. for coast agencies.)
Paraffine Paint Co., 34 First St., San Francisco.
Biturine Company, 24 California St., San Francisco.

STEEL REINFORCING
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Southern California Iron & Steel Company, Fourth and Mateo Sts., Los Angeles; W. B. Kyle, San Francisco representative, Call Bldg.
Woods, Huddart & Gunn, 444 Market St., San Francisco.

STEEL ROLLING DOORS
Kinnear Steel Rolling Door Co., Rialto Bldg., San Francisco.

STEEL SASH
"Fenestra," solid steel sash, manufactured by Detroit Steel Products Company, Detroit, Mich.

STEEL WHEELBARROWS
Champion and California steel brands, made by Western Iron Works, 141 Beale St., San Francisco.

STONE
California Granite Co., 518 Sharon Bldg., San Francisco.
McGilvray Stone Company, 634 Townsend St., San Francisco.

LATH, SHINGLES, SHAKES and POSTS, SASH, DOORS and MILL WORK
TIMBERS and SPECIALS *KILN DRIED FINISH and FLOORING*

SUNSET LUMBER COMPANY
DEALERS WHOLESALE AND RETAIL IN
PINE and REDWOOD LUMBER

PHONE OAKLAND 1820
YARDS AND OFFICE
OAK AND FIRST STS., OAKLAND, CAL.

PORTLAND LUMBER CO.

Yards { TRACY, CAL. / BRENTWOOD, CAL.
Phone KEARNY 2074

PORTLAND LUMBER COMPANY
A. J. RUSSELL, Agent
LUMBER
SIMPLEX SILOS
SAGINAW SPECIAL SHINGLES
Ship Timbers, Oil Rigs and
Special Bills Cut to Order.
16 California Street San Francisco, Cal.

Millwork Manufactured
and Delivered Anywhere
Plans or Lists sent us for Estimates will
have Careful and Immediate Attention
DUDFIELD LUMBER CO.
Main Office, Yard and Planing Mill - PALO ALTO
JNO. DUDFIELD, President and Manager JOSEPH A. JURY, Secretary and Mill Supt.

Phone Kearny 2080

UNITED LUMBER MILLS
Pine and Redwood Lumber
WHOLESALE AND RETAIL—ESTIMATES GIVEN
687 MARKET STREET SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

STORAGE SYSTEMS—GASOLINE, OIL, ETC.
S. F. Bowser & Co., 612 Howard St., San Francisco.
Rix Compressed Air and Drill Co., First and Howard Sts., San Francisco.

TELEPHONE AND ELECTRIC EQUIPMENT
Aylsworth Agencies Company, 591 Mission St., San Francisco.

TELEPHONE SIGNALS
Sierra Electric Construction Co., Call-Post Bldg., San Francisco.

TEMPERATURE REGULATION
Johnson Service Company, 149 Fifth St., San Francisco.

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market St., San Francisco.

TILES, MOSAICS, MANTELS, ETC.
Rigney Tile Company, Sheldon Bldg., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.
McElhinney Tile Co., 1097 Mission St., San Francisco.

TILE FOR ROOFING
Gladding, McBean & Co., Crocker Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

TILE WALLS—INTERLOCKING
Denison Hollow Interlocking Blocks, Forum Bldg., Sacramento.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

VACUUM CLEANERS
Palm Vacuum Cleaners, sold by Western Vacuum Supply Co., 1125 Market St., San Francisco.
Spencer Turbine Cleaner, sold by Hughson & Merton, 530 Golden Gate Ave., San Francisco.

VALVES
Sloan Royal Flush Valves. T. R. Burke, Pacific Coast agent, Wells Fargo Bldg., San Francisco.
Crane Radiator Valves., manufactured by Crane Co., Second and Brannan Sts., San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
Berry Bros., 250-256 First St., San Francisco.
W. P. Fuller Co., all principal Coast cities.
Pacific Coast Paint Corp'n, 112 Market St., San Francisco; Security Bank Bldg., Oakland.
R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
Standard Varnish Works. San Francisco.
S. F. Pioneer Varnish Works, 816 Mission St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
Burlington Venetian Blinds, Burlington, Vt., and C. F. Weber & Co., 365 Market St., San Francisco.
Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.

WALL BEDS, SEATS, ETC.
Lachman Wall Bed Co., 2019 Mission St., San Francisco.
Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.

WALL BEDS, SEATS, ETC.—Continued
Peck's Wall Beds, sold by Western Equipment Co., 72 Fremont St., San Francisco.
Perfection Disappearing Bed Co., 739 Mission St., San Francisco.

WALL BOARD
"Amiwud" Wall Board, manufactured by Paraffine Paint Co., 34 First St., San Francisco.

WALL PAINT
Nason's Opaque Flat Finish, manufactured by R. N. Nason & Co., San Francisco, Portland and Los Angeles.
San-A-Cote and Vel-va-Cote, manufactured by the Brininstool Co., Los Angeles.

WALL PAPER
Uhl Bros., 38 O'Farrell St., San Francisco.
The Tormey Co., 681 Geary St., San Francisco.
Art Wall Paper Co., 500 Ellis St., San Francisco.

WATER HEATERS—AUTOMATIC
Pittsburg Water Heater Co. of California, 478 Sutter St., San Francisco, and 402 Fifteenth St., Oakland.

WATERPROOFING FOR CONCRETE, BRICK, ETC.
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Biturine Company, 24 California St., San Francisco.
H. W. Johns-Manville Co., San Francisco and principal Coast cities.
Imperial Co., 183 Stevenson St., San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Wadsworth, Howland & Co., Inc. (See adv. for Coast agencies.)

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL FINISH
"Gold Seal," manufactured and sold by Bass-Hueter Paint Company. All principal Coast cities.
"Silkenwhite," made by W. P. Fuller & Co., San Francisco.
"Satinette," Standard Varnish Works, 113 Front St., San Francisco.

WINDOWS—REVERSIBLE, CASEMENT, ETC.
Whitney Window, represented by Richard Spencer, Hearst Bldg., San Francisco.
Hauser Reversible Window Co., Balboa Bldg., San Francisco.
International Casement Co., represented by Edwin C. Dehn, Hearst Bldg., San Francisco.

WIRE FABRIC
U. S. Steel Products Co., Rialto Bldg., San Francisco.

WOOD MANTELS
Fink & Schindler, 218 13th St., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.

Lachman WALL BED CO.
2019 MISSION ST. NEAR 16TH
SAN FRANCISCO

The Most Up-to-Date WALL BEDS

Perfect Concealment — Simple Installation
Economy of Space — Most Inexpensive
Only 16" in depth required — Strong and Durable

THERE is something Cheery about a White Cement House that appeals to the owner. Possibly that is why Stucco Homes have predominated in California in recent years.

DEL MONTE WHITE SAND

and

FAN SHELL BEACH SAND

used with a White Cement make a perfect stucco finish.

Pacific Improvement Company

406 Crocker Building

Phone Sutter 6130 San Francisco

This House Designed by Architects Heiman-Schwartz is Equipped with PITCHER HANGERS.

A Smooth Running Noiseless door hanger is a delight to the discriminating housewife.

A Pitcher

Hanger is an asset to Every Home, Apartment House and Hotel. Manufactured by

NATIONAL MILL & LUMBER COMPANY

326 Market Street
San Francisco

Telephone Kearny 3580

MOTT PLUMBING FIXTURES

Architects and their clients are invited to visit our Showrooms, 135 Kearny St., San Francisco; D. H. GULICK, Sales Agent. Los Angeles Office, 1001 Central Building; J. R. MAYHEW, Sales Agent. Portland, Ore., Office, Sherlock Bldg.; F. J. KANE, Sales Agent. Seattle, Wash., Office, Securities Bldg.; P. C. WAACK, Sales Agent.

THE J. L. MOTT IRON WORKS
Established 1828

CALIFORNIA STEAM AND PLUMBING SUPPLY CO.

PIPE, VALVES AND FITTINGS
FOR
STEAM, GAS, WATER AND OIL

COMPLETE STOCK OF
The Kelly & Jones Company Products
WRITE FOR CATALOGUE

OFFICE AND WAREHOUSE:
671-679 FIFTH STREET
Corner Bluxome
SAN FRANCISCO, CALIFORNIA

Telephone Sutter 737

ROYAL FLUSH VALVES

are suited to all classes of buildings and all kinds of bowls or urinals. Require no regulating, adapted to any pressure above five pounds and supplied from street main, roof-tank or pneumatic tank. They excel absolutely.

SLOAN VALVE COMPANY

Chicago, Ill. and 624 Wells Fargo Building, San Francisco

Pacific Coast Distributors:

R. W. KINNEY CO., San Francisco	MILLER-ENWRIGHT CO., Sacramento	HUGHES CO., Spokane
N. O. NELSON MFG. CO., Los Angeles	BOWLES CO., Seattle M. L. KLINE, Portland	WALSH & GARDNER Tacoma

SPECIFY GLAUBER FAUCETS

not only because they are GUARANTEED FIVE YEARS, but because of the QUALITY which enables us to guarantee them.

The Jury of Awards at the P. P. I. E. gave us **Seven Medals**, not because we indemnify our users against trouble with our goods, but because **Glauber Quality Faucets** don't cause trouble.

Three hundred of the best buildings on the Pacific Coast are equipped with **Glauber Cocks.**

Send for illustrated specification book.

Main Office and Factory CLEVELAND, O.

Glauber Brass Mfg. Co.
567 Mission Street, San Francisco, Cal.

Eastern Branch 130 W. 32nd St. NEW YORK

VITROLITE
"BETTER THAN MARBLE"

stands alone ... and is the best Paving Block ...

It is used on the streets of SAN FRANCISCO, OAKLAND, SAN JOSE, BERKELEY, SAUSALITO, LIVERMORE, SARATOGA, CALISTOGA and other California Cities.

Its use Insures Satisfactory and Permanent Pavements

INVESTIGATE NOW SAMPLES FURNISHED

California Brick Company

NILES, CALIFORNIA

Representatives at San Francisco and Oakland Exchanges

LIVERMORE PRESSED, MATT GLAZED AND ENAMELED BRICK

in a variety of colors including "Mottles," "Ruff," White, Ivory White, Cream, Grey, Green, Brown, Blue, etc., are designed to meet the requirements of Architects desiring permanent and unique effects.

Full size sample sent on request.

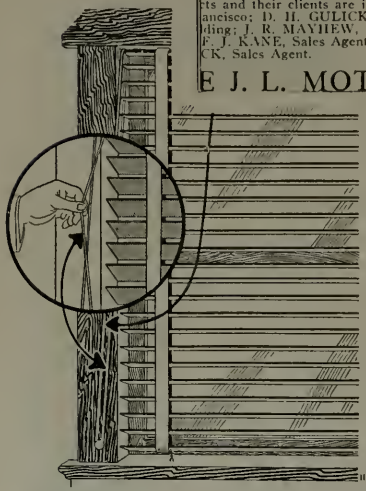
LARGE PRODUCTION—ATTRACTIVE PRICES—PROMPT DELIVERIES

Livermore Fire Brick Works

LIVERMORE, CALIFORNIA

Representatives at San Francisco and Oakland Exchanges

The Slats can be adjusted to Any Angle, supplying Light of the Exact Intensity Required.



OTT PLUMBI FIXTUR

UNION HIGH SCHOOL, Carruthers, California Equipped with WESTERN VENETIAN BLINDS.

ts and their clients are invited to visit our Showrooms, I ancisco; D. H. GULICK, Sales Agent. Los Angeles Of lding; J. R. MAYHEW, Sales Agent. Portland, Ore., Of F. J. KANE, Sales Agent. Seattle, Wash., Office, Securi CK, Sales Agent.

E J. L. MOTT IRON WOR

Perfect light and ventilation assured with

Western Venetian Blinds

All direct sunlight and glare eliminated. Made to fit all types and sizes of school windows. Easy to operate and will last as long as the building.

WESTERN BLIND & SCREEN CO.
2700 Long Beach Ave., LOS ANGELES

C. F. WEBER & CO.
AGENTS
San Francisco — Los Angeles
Reno, Nev. — Phoenix, Ariz.

BUTTONLATH SUSPENDED CEILING

SUSPENDED CEILINGS GIVE UNIFORM PLASTERING SURFACE, are rapid in erection and perfect BUTTONLATH non-conductors of sound. They also have striking advantage of low cost combined with severely tested capacity for fire resistance.

BUTTONLATH MANUFACTURING CO.

Boyle and Vernon Avenues, LOS ANGELES, CAL.
77 O'Farrell Street, SAN FRANCISCO, CAL.

VITROLITE
"BETTER THAN MARBLE"

VITROLITE
"Better Than Marble"

City Hall, San Francisco
Bakewell & Brown, Architects

IDEAL FOR TOILETS

For toilet partitions and wainscoting in toilet and bathrooms Vitrolite is unsurpassed. It is snow white—unstainable and impervious to the action of acids. Its brilliantly polished surface can be sterilized without injury. Our new toilet construction is the essence of sanitation and durability. We will gladly send details.

THE VITROLITE CONSTRUCTION COMPANY
1490 Mission Street San Francisco, California

Schaw-Batcher Co.
Pipe Works

RIVETED STEEL PIPE
PRESSURE TANKS
STORAGE TANKS
WELL CASING

ALL KINDS HEAVY STEEL PLATE WORK

356 Market St., San Francisco Works, South San Francisco

QUALITY PAINT PRODUCTS
Brininstool

San-a-Cote (GLOSS

(CAN BE SCRUBBED)

AN INTERIOR WALL FINISH

For bath rooms, kitchens, hospitals, schools, office and public buildings. Ask dealers, owners, architects and contractors about this durable, sanitary, washable, economical wall covering.

Brininstool makes a paint for every purpose, and every can purposely good

THE BRININSTOOL CO., LOS ANGELES

COLOR GRINDERS AND PAINT MANUFACTURERS

Distributors—The Brininstool Co., care of Haslett Warehouse Co., 310 California St., San Francisco; Schutz Paint Co., Fresno, Cal.; Schneider, Chappell & Jones, Sacramento, Cal.; Salt Lake Glass & Paint Co., Salt Lake City, Utah; Griffin Paint Co., Ogden, Utah; Ernest Miller Wall Paper Co., 172 First St., Portland, Ore.; Hickox-Crampton Paint Co., Tacoma, Wash.; Campbell Hardware Co., First and Madison Sts., Seattle, Wash.; Imperial Valley Hardware Co., El Centro, Calexico, Imperial, Brawley Seeley; Spokane Hardware Co., Spokane, Wash.; Ellis Paint Co., Butte, Mont.; Simons Paint and Paper Co., Missoula, Cal.

Comfort

we know is a first essential in the designing and building of beds. You can install our Oscillating Portal Wall Beds and be assured that they will give tenants absolute comfort and satisfaction. Eleven years of experience have taught us what springs to use, how to hang them and all the other little points that make for comfortable sleeping.

Our Wall Beds are as comfortable as the best bed you have ever slept in.

MARSHALL & STEARNS CO.

WALL BEDS

1152 PHELAN BUILDING — SAN FRANCISCO
1774 BROADWAY — OAKLAND

GEO. H. DYER, President — R. W. DYER, Vice-Pres. — W. J. DYER, Sec'y

DYER BROTHERS

Golden West Iron Works, Inc.

Structural Iron and Steel Contractors

ORNAMENTAL IRON WORK

Office and works:
17th and KANSAS STREETS

SAN FRANCISCO, CAL.
Phone Market 134

United States Mint, San Francisco

All stone work on this building has been treated with

IMPERIAL WATER PROOFING

to prevent absorption and disintegration. The process leaves the stone in its natural color.

WE SPECIALIZE
IN

WATER PROOFING PROBLEMS

Above Ground — Under Ground

IMPERIAL COMPANY
Builders Exchange Building
183 Stevenson St. San Francisco

Stucco of Permanent Beauty

Johns-Manville Asbestos Stucco is different. Instead of the sand ordinarily used, its base is asbestos, mixed with Portland Cement—thus combining two of Nature's most durable minerals.

Johns-Manville Asbestos Stucco

insulates against heat and cold, and acts as an effective barrier to neighborhood fires. It is not affected by water or sudden changes of temperature, and the fibrous nature of the binder—asbestos—reduces cracking, flaking, etc., to a minimum.

Many desirable finishes or textures—from a flat finish to a very rough cast—are possible with this stucco.

Booklet sent free on request.

H.W. JOHNS-MANVILLE CO.
OF CALIFORNIA
2nd & Howard Sts., SAN FRANCISCO
Los Angeles Sacramento San Diego

Stationary Outfit

To ARCHITECTS and ENGINEERS

The Public is tired of buying Gasoline by hidden measurement—All up-to-date equipments demand the VISIBLE Method of Supply.

DELANOY VISIBLE SYSTEM

Any station equipped with the visible apparatus will sell from 25 to 50 per cent more gasoline than by the ordinary method. Send for Circulars.

RIX COMPRESSED AIR & DRILL CO.
Sole Manufacturers
San Francisco Los Angeles

"THE BOUDOIR" (Reg. Trade Mark)
Pat. Dec. 1913, Jan. 1915

Examine any bathroom, or any plan of a bathroom, with three separate fixtures set in any of the customary ways.

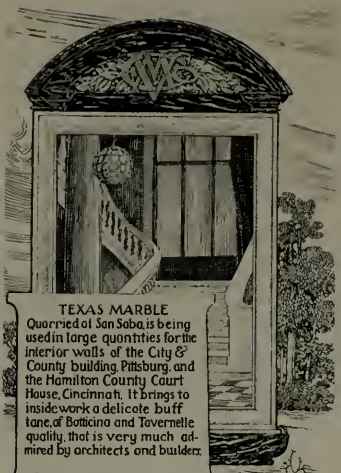
Cut out the separate lavatory, all its fittings, supply and waste pipes, trap, vent and connections. Sum up the cost of these, then

Substitute "THE BOUDOIR" Bath Fixture, with its large 20x24-inch pedestal lavatory, accessibly placed, taking no space usable for any other purpose.

Notice the improved appearance, additional room, the gained conveniences of a sitting shower, shampoo, washing in fresh running water, support in getting in and out of the bath tub, fewer fittings to polish and keep in order.

Prompt deliveries anywhere from our nearest Factory.

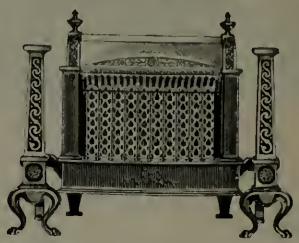
IMPROVED SANITARY FIXTURE COMPANY, 632 Metropolitan Bldg., Los Angeles, California, - U. S. A.



TEXAS MARBLE
Quarried at San Saba is being used in large quantities for the interior walls of the City & County building, Pittsburg, and the Hamilton County Court House, Cincinnati. It brings to inside work a delicate buff tone, of Botticino and Tavernelle quality, that is very much admired by architects and builders.

VERMONT MARBLE CO.
PROCTOR, VT.
SAN FRANCISCO PORTLAND TACOMA

THE HUMPHREY Radiantfire
A TRIUMPH IN GAS HEATING



Designed for installation in open fireplaces. No unburned gases, odorless, and does not vitiate the air of the room.

Fascinating effect and high heat efficiency.

GENERAL GAS LIGHT COMPANY
C. B. BABCOCK, Manager
768 Mission Street San Francisco

A BEAUTIFUL HOME—
IMPOSING ENTRANCE POSTS, Fence and Garden Ornaments, made of Cement, add an Indisputable Touch of Beauty and Feeling of Comfort to the Real Country House. The Fence, Posts, and Fruit Baskets shown in this picture were made by

G. Rognier & Co.

Garden Furniture, Flower Pots, Vases Sun Dials, etc.

Designs Submitted 233 Railroad Ave., SAN MATEO, CAL.

VACATION
SPEND IT IN THE BEAUTIFUL
FEATHER RIVER COUNTRY
IN THE
HEART OF THE HIGH SIERRAS
REACHED ONLY VIA

WESTERN PACIFIC

NUMEROUS RESORTS ALONG THE
FAMOUS FEATHER RIVER
AND NEAR THE LAKES AND STREAMS
WHERE
The Fish and Game Abound
All Forms of Outdoor Sports
LOW FARES TO ALL POINTS
Folders Free on Request

Ticket Offices:
665 Market Street and Ferry Building, San Francisco. Phone Sutter 1651
1326 Broadway, Oakland. Phone Oak. 600

Beautiful Oak Floors

EVERYWHERE—WHY?

BECAUSE—

—Oak Flooring, by right of superior merit and conquest, is "America's Best Flooring."

—Women prefer Oak Flooring for the reason it is rich and cheerful in color, and offers unlimited possibilities to give the home that coveted touch of elegance.

—Oak Flooring is Distinctive, Beautiful and Substantial, three very vital reasons why so much Oak Flooring is in use today.

—Owners always demand Oak Flooring as they consider it a good investment. It attracts and satisfies buyers or tenants.

—Of all the hardwood flooring in use today American Oak stands pre-eminent for color, texture and durability.

—Keeps the "For Rent" and "For Sale" signs off the property. Landlords know what is best in flooring.

—Solving the floor problem is possible by OAK FLOORING.

—Increases the selling and renting value of any building, and attracts a better class of buyers, or tenants.

See our page 379—1917 Sweet's Catalogue.

Write for booklets—"America's Best Flooring."

Oak Flooring Service Bureau

1603 UNION TRUST BLDG., CINCINNATI, OHIO

RUBBER GOODS

for

ALL KINDS OF BUILDINGS

including

MATS MATTING TILING

Cotton, Linen and Rubber HOSE

FIRE EXTINGUISHERS

GOODYEAR RUBBER CO.

587-589-591 Market St. San Francisco, Cal.

One of the many attractive booths at the Building Material Exhibit

Building Material Exhibit

77 O'Farrell Street
San Francisco

Architects, owners and builders are invited to visit this exhibit and enjoy its many conveniences.

HOTEL ST. FRANCIS

SAN FRANCISCO

Most Beautifully Decorated Public Rooms in the World
European Plan from $2.00

Management :: :: :: JAMES WOODS

STEEL BARS FOR CONCRETE REINFORCEMENT

TWISTED SQUARES, PLAIN SQUARES AND ROUNDS
We Will Make Lump Sum Bids on Reinforcement Fabricated and Installed.

PIG IRON, COKE AND FERRO ALLOYS

WOODS, HUDDART & GUNN

444 MARKET STREET Tel. Sutter 2720 SAN FRANCISCO, CAL.

STEEL OPEN HEARTH BARS FOR CONCRETE REINFORCEMENT

Square Corrugated and Cold Twisted, Plain Rounds and Squares
-----MERCHANT STEEL-----
Flats, Angles, Channels, Rounds, Squares, Rivet & Bolt Steel, Structural Shapes

PACIFIC COAST STEEL COMPANY

PHONE SUTTER 1564

General Office, Rialto Bldg., San Francisco
Sales Office, " " "
Sales Office, Union Oil Building, Los Angeles
Sales Office, Seattle, Wash.

ROLLING MILLS:
South San Francisco
Seattle, Wash. Portland, Ore.

Pack your Radiator Valves with

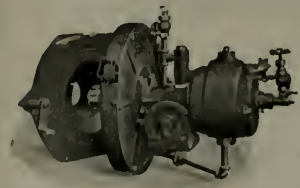
Palmetto Twist Packing

It can be unstranded to fit any size valve. It does not get hard.

H. N. COOK BELTING CO.

317-319 Howard St. San Francisco, Cal.

THE RAY OIL BURNING SYSTEM—1917 MODEL



Improvements: Enclosed motors, dust, oil and water proof; oil-cooled motor runs 75 per cent cooler; oil heated electrically. Only one place to lubricate for entire machine, and many more exclusive features. Send for catalogue.

W. S. RAY MFG. CO.

Salesroom, 218-220 Market St., SAN FRANCISCO
Phone Kearny 199

Works, Bosworth, Milton & Rousseau, S. P. R. R., San Francisco. Phone Mission 5022

VULCANITE ROOFINGS

including

Rolls, Shingles and Ornamental Effects

ARE

Durable, Damp-proof and Decorative

VULCANITE MOSAIC ROOF
on Bungalow, Porterville

VULCANITE GREEN SLATE ROOFING on $20,000 Residence, Fresno

VULCANITE ASPHALT SHINGLES
on Oakland Residence

OUR SPECIALTIES ARE

- Fire-Resisting
- Do Not Dry Out
- No Cracking
- Non-fading colors
- Unequaled for wear
- Weather-Resisting

ESTABLISHED 1876

APPROVED BY NATIONAL BOARD OF FIRE UNDERWRITERS

Specifications, Color Sheets and Samples on Request

PATENT VULCANITE ROOFING COMPANY

San Francisco Depot
16th and Texas Streets

Telephone Market 390
SAN FRANCISCO, CAL.

REGISTERED PREPARED VULCANITE ROOFINGS TRADE MARK

Cahuenga Branch Library, Los Angeles

C. H. RUSSELL, Architect

Covered with No. 1

MISSION CLAY ROOFING TILE

MANUFACTURED BY

LOS ANGELES PRESSED BRICK CO.

FROST BUILDING, LOS ANGELES

UNITED MATERIALS COMPANY

CROSSLEY BUILDING, SAN FRANCISCO

Distributors for Northern California

The GOLD MEDAL MAIL CHUTE

INSTALLED IN THE NEW SAN FRANCISCO CITY HALL AND THE WHITE MARBLE MERRITT BUILDING, LOS ANGELES

Given highest award at Panama-Pacific International Exposition, 1915.

Represented on the Pacific Coast by

United States Metal Products Co.
525 Market Street
SAN FRANCISCO
Agents for California and Oregon
F. T. CROWE & CO.
Seattle
Agents for Washington.
American Mailing Device Corporation

The Cutler Mail Chute

Mail Box—L. C. Smith Building Seattle, Wash., Gaggin & Gaggin, Architects, Syracuse, N. Y.

Pacific Coast Representatives:

San Francisco, Cal., THOMAS DAY COMPANY.

Portland, Ore. C. W. BOOST.

Seattle and Tacoma, Wash., D. E. FRYER & CO.

Spokane, Wash. E. C. TOUSLEY.

Cutler Mail Chute Co.,
ROCHESTER, N. Y.
Cutler Building.

BIGLEY'S

Curtains
Decorated Lamps
and Pottery
Fine Upholstered
and Period
Furniture

498 GEARY STREET
San Francisco, Cal.
Telephone: Franklin 5919

THE·L·SCHREIBER & SONS Co

ORNAMENTAL IRON & BRONZE
STRVCTVRAL STEEL
CINCINNATI

SAN FRANCISCO
WESTERN BVILDERS SVPPLY CO
155 NEW MONTGOMERY ST.
LOS ANGELES
SWEETSER & BALDWIN SAFE CO
200 EAST 9TH ST

CRANE

CAST IRON
BRASS
CAST STEEL
FERROSTEEL

FLANGED FITTINGS

We have the largest line of patterns for flanged fittings for low pressure, standard, extra heavy, hydraulic, superheated and extreme hydraulic pressures, ranging in size from one-inch to sixty-inch, and for working pressures from fifty pounds to three thousand pounds.

The dimensions of the low pressure, standard and extra heavy fittings are in accordance with the 1915 *American Standard*.

Castings for special fittings also may be made at a minimum expense owing to our large equipment of special patterns which may be altered at very low cost.

CRANE CO.

PLUMBING SUPPLIES

2nd and Brannan Sts., SAN FRANCISCO.

348 9th Street OAKLAND

H. E. BOTHIN, PRESIDENT
W. H. FRENCH, VICE-PRES. AND GEN MANAGER
R. B. GIRDWOOD, SECRETARY

JUDSON MANUFACTURING CO.

MANUFACTURERS OF
OPEN HEARTH STEEL
INGOTS, BARS, PLATES AND SMALL SHAPES

STRUCTURAL AND BRIDGE WORK
FOUNDRY, MACHINE AND PATTERN WORK
SHAFTING, BOLTS, SPIKES ETC.

MAIN OFFICE AND SALESROOM
818-823 FOLSOM STREET
TELEPHONE DOUGLAS 4848

OPEN HEARTH STEEL BARS

STRUCTURAL STEEL

Machine Work—Bolts—Castings
Pattern and Blacksmith Work

SIDEWALK LIGHTS

SIMPLEX SYSTEM

Pre-cast reinforced concrete slabs for frames. Combines all the advantages of cast iron and the ordinary concrete type.

PACIFIC BUILDING MATERIALS CO.

523 Market St. TELEPHONE KEARNY 3323 S. F.

FORUM BUILDING, SACRAMENTO, CAL.
R. A. Herold, Architect

The above is a Progress Picture of the Four Story addition to Sacramento's Largest Office Building, Now Completed.

STRUCTURAL STEEL FABRICATED AND ERECTED BY

The Palm Iron and Bridge Works

(Incorporated)

15th and R. Sts., Sacramento, Cal.

CALIFORNIA ARTISTIC METAL & WIRE CO.
J. T. McCORMICK, PRESIDENT
ORNAMENTAL IRON AND BRONZE
349-365 SEVENTH ST. SAN FRANCISCO

MORTENSON CONSTRUCTION CO.
CONTRACTORS FOR STRUCTURAL STEEL AND IRON
H. MORTENSON, Pres. CHAS. G. MORTENSON, Vice-Pres. and Mgr.
OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS
PHONE: MISSION 5033 SAN FRANCISCO, CAL

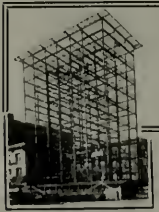
WEST COAST WIRE AND IRON WORKS
MANUFACTURERS OF
ARTISTIC BRONZE, IRON AND WIRE WORK
OF EVERY DESCRIPTION AND FINISH
861-863 HOWARD STREET SAN FRANCISCO, CAL.

FAIR MANUFACTURING COMPANY
J. FEY KERT, Proprietor
ORNAMENTAL AND MISCELLANEOUS IRON WORK
617 BRYANT STREET, SAN FRANCISCO Douglas 5122

THE GOLDEN GATE IRON WORKS
STRUCTURAL STEEL
1541-1549 HOWARD STREET, BETWEEN 11th AND 12th STREETS
Tel. Market 5445 San Francisco

Telephones Mission 139—Mission 59 A. A. Devoto, President
CENTRAL IRON WORKS, Inc.
STRUCTURAL STEEL
Office and Works: 621-651 Florida Street
Bet. Harrison and Bryant, 18th and 19th SAN FRANCISCO, CAL.

TWISTED and DEFORMED STEEL BARS *FOR REINFORCED CONCRETE CONSTRUCTION.*
Southern California Iron & Steel Co.
FOURTH AND MATEO STREETS
LOS ANGELES, CAL.
W. B. KYLE, New Call Building,
San Francisco Representative.



SCHRADER IRON WORKS, Inc.
STRUCTURAL STEEL CONTRACTORS
Fire Escapes, Waterproof Trap Doors, Ornamental Iron Work
1247-1249 HARRISON STREET
Bet. 8th and 9th
SAN FRANCISCO, CAL.
Telephone Market 337

P. Noble, Pres.
E. B. Noble, Vice-Pres.
A. E. Wilkins, Sec'y

Beam, Angle, Channels, and Universal Mill Plates for immediate shipment from stock

Pacific Rolling Mill Co.

SUPPLIERS OF

FABRICATED STRUCTURAL STEEL, Forgings, Bolts, Rivets, Frogs, Switches, Cast Iron Castings

General Office and Works
17th and MISSISSIPPI STS., SAN FRANCISCO
Telephone Market 215

W. B. MORRIS, President H. M. WRIGHT, Vice-President L. J. GATES, Secretary

WESTERN IRON WORKS

STRUCTURAL IRON and STEEL CONTRACTORS

Gas Holders, Vault Linings, Jails, Fire Escapes, Beams, Channels, Angles and Steel Wheelbarrows Carried in Stock

Phones: Kearny 575
J 1259

141-147 BEALE STREET
132-148 MAIN STREET
SAN FRANCISCO, CAL.

TELEPHONE. MISSION 1763

C. J. HILLARD CO., Inc.

MANUFACTURERS OF

Bank and Office Railings. Elevator Enclosures and Cars.
Cast Iron Stairs and Store Fronts. Wire Work. Fire Escapes.

Nineteenth and Minnesota Sts.
Next to California Canneries

San Francisco, Cal.

Structural Steel
Ornamental Iron
Ornamental Bronze
Prison Work
Vault Work
Metal Furniture
Filing Devices
Library Shelving
Stock Room Shelving
Steel Lockers
Electroliers

RALSTON IRON WORKS

INCORPORATED
TWENTIETH AND INDIANA STREETS
SAN FRANCISCO, CALIFORNIA
PHONE MISSION 5230

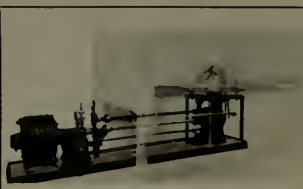
Antiquities, Artistic Ornaments for the Interior

A little expenditure adds to your Home Decorations the Grace of Genuineness and Rare Artistry.

A. FALVY

578-580 SUTTER STREET

Tel. Sutter 6939 SAN FRANCISCO



Architects designing hotels, apartment houses, theatres and office buildings, should keep in mind the fact that THREE BARRELS OF FUEL OIL burned by the

Fess System

will equal the heat produced by a TON OF COAL — *Economy for the Owner.*

And that the FESS SYSTEM is the Only Fire-Proof Rotary Burner manufactured — *More Economy for the Owner — Less Insurance to pay.*

Fess System Rotary Crude Oil Burners
FOR HEATING, POWER, COOKING
Office and Factory — 218 Natoma St., San Francisco
Branches — 1310 So. Hill St., Los Angeles; 428 Alder St., Portland, Ore.; 132 B St., San Diego.

Hipolito

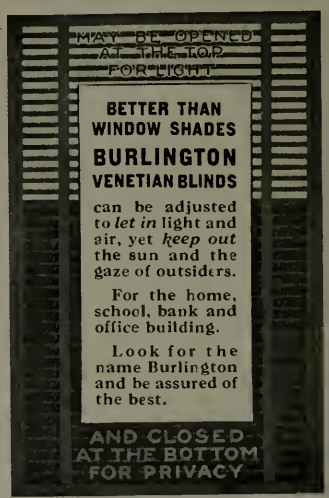
EVEN TENSION
Window Screens Screen Doors

ROLLER SCREENS
For Casement Windows

METAL FRAME SCREENS

SEE DISPLAY AT
Building Material Exhibit
77 O'Farrell St. San Francisco

Simpson & Stewart
FACTORY DISTRIBUTORS
565 16th St., Oakland, Cal.
TELEPHONE LAKESIDE 415


MAY BE OPENED
AT THE TOP
FOR LIGHT
BETTER THAN
WINDOW SHADES
BURLINGTON
VENETIAN BLINDS
can be adjusted to *let in* light and air, yet *keep out* the sun and the gaze of outsiders.
For the home, school, bank and office building.
Look for the name Burlington and be assured of the best.
AND CLOSED
AT THE BOTTOM
FOR PRIVACY

Burlington Venetian Blind Co.
BURLINGTON VT. 365 MARKET ST., SAN FRANCISCO

Illinois Automatic Vacuum and Vapor Systems of Heating

Improved with graduated control. You can have much heat or little as conditions demand. Our Thermo Trap prevents any waste of heat and consequently saves fuel. Used in the biggest buildings and factories all over the United States and Canada.

We also manufacture a full line of Hughson, John Davis, Eclipse Pressure Reducing Valves and Back Pressure Valves, Oil Separators, etc.

"Twenty-five years of quality."

We carry a full line in San Francisco.

ILLINOIS ENGINEERING COMPANY

JAS. I. KRUEGER, *Representative*

559-561 Pacific Building, San Francisco

Telephone: Kearny 3047

The DUNHAM VAPOR HEATING SYSTEM

Represents the highest development in heating.

The DUNHAM VAPOR HEATING SYSTEM represents the highest quality to be found in any vapor system on the market. It sells for the most money because the devices furnished with the DUNHAM SYSTEM are complete and perform a real service in vapor heating, not found in imitating systems.

The DUNHAM VAPOR HEATING SYSTEM is both a heating system and a temperature regulating system. It appeals to the owner seeking a heating system which will add refinement to his home.

C. A. DUNHAM COMPANY

WELLS FARGO BUILDING SAN FRANCISCO, CAL.

JOHN A. HOOPER, Pres. FRANK P. HOOPER, Vice-Pres. A. W. HOOPER, Sec'y

Hooper Lumber Company

Wholesale and Retail Dealers in

OREGON PINE AND REDWOOD

17th and Illinois Sts., San Francisco

Car shipments to all Central California Points
Schooner shipments to Bay and River landings

Contractors' House Bills solicited
Phone Market 5313

OIL BURNERS
VACUUM PLANTS
ICE MACHINES

The Three Essentials for the Up-to-date HOTEL and APARTMENT HOUSE.

With a JARVIS Guarantee Your Troubles Are Over.

Home Manufacture—Everything but the motors

T. P. JARVIS CRUDE OIL BURNING COMPANY

Phone Market 3397 275 Connecticut Street, SAN FRANCISCO

NILES SAND GRAVEL & ROCK CO.
GRAVEL BEDS AND PLANT, NILES, CALIFORNIA
MAIN OFFICE
MUTUAL BANK BUILDING
704 MARKET ST.
SAN FRANCISCO
TELEPHONE DOUGLAS 182

GRAVEL

Crushed and screened concrete Gravel and Rock.
Sharp, clean Concrete Sand, or Topping. All from fresh water, thoroughly washed, and in any size or mixture, with or without sand, as desired.
Free from Salt.

A. F. EDWARDS, President
J. M. FABBRIS, Vice-President
J. A. MACKENZIE, Secretary
CHAS. F. EISELE, J. RUBIOLO, Asst. Managers

AMERICAN MARBLE & MOSAIC CO.
25-29 Columbia Square, San Francisco
Telephone Market 5070
Factory on Canal, South San Francisco Telephone South San Francisco 161

THE BITURINE COMPANY
Specializing in Protective Coatings for Iron and Steel
STRUCTURAL STEEL PAINT
INTERIOR TANK ENAMEL
Telephone Kearny 4478
24 CALIFORNIA STREET SAN FRANCISCO

THE KINNEAR MFG. CO.
COLUMBUS, OHIO
STEEL ROLLING FIREPROOF DOORS AND SHUTTERS
Agents
Seattle - Portland - Los Angeles - Salt Lake City
San Francisco Office 517 Rialto Building

THE ARCHITECT & ENGINEER

VOL. L. OF CALIFORNIA No. 2

CONTENTS FOR AUGUST, 1917

	Page
Cover Picture, Bungalow of Mr. John A. Britton, Redwood City Frederick H. Meyer, Architect	
Frontispiece—Washington Monument	38
Domestic Architecture Kenneth MacDonald, Jr., Architect	39
Unique Los Angeles Apartments	55
San Francisco Architects and Artists as Camoufleurs	58
A New Working Plant for the First Congregational Church of Pasadena, California Leon Caryl Brockway, Architect	59
The Housing Aspect of the City Planning Problem Paul Scharrenberg	66
San Francisco Engineer Criticises Amended Architects' License Law E. T. Thurston, C. E.	71
Accidents on Construction Work J. J. Rosenthal	74
Revised Specifications for Mill Construction	79
Why This Is the Time to Build	82
Competitions W. Jones Cuthbertson	87
Planning the Library John Herbert Weeks	88
Effects of Grading of Sands and Consistency of Mix Upon the Strength of Concrete	96

Published Monthly at 626-627 Foxcroft Building, San Francisco in the interest of

ARCHITECTS, STRUCTURAL ENGINEERS, CONTRACTORS AND THE ALLIED TRADES OF THE PACIFIC COAST

Yearly Subscription $1.50
Sing'e Copy 25 cents

Entered at San Francisco Post Office as Second Class Matter

Copyright 1917 by A. I. Whitney
All Rights Reserved

THE GLOWING TIP OF THE WASHINGTON MONUMENT SEEN THROUGH THE COLONNADE OF THE NATIONAL TREASURY BUILDING, WASHINGTON, D. C.

Frontispiece
The Architect and Engineer
of California
for August, 1917.

THE
ARCHITECT
AND
ENGINEER
OF CALIFORNIA

Volume L. AUGUST · 1917 Number 2.

Domestic Architecture

By KENNETH MacDONALD, Jr., Architect.

ANY one travelling out Geary street, in the neighborhood of First avenue, San Francisco, will see a row of soap boxes, divided into compartments, intended, presumably, for the use of human beings. A large sign may be seen bearing the inscription in bold Roman type, "Homes, not Houses." Here is food for thought. An inspection of the premises prompts the suggestion that one more "not" should be added to the sign, making it read, "Not Homes, not Houses."

Some of the houses put up by builders, however, are at least habitable, which is more than can be said of some of the houses built by architects. The builder never puts the main bedroom where it does not receive the morning sun. In fact the builder makes few mistakes which hurt the convenience of the house, simply because he has to sell it.

If some of the architects would go through the houses put up by builders, and would add their experience and training to what they find, there is no doubt the result would be good. Most architects do not listen to the suggestions of the women who manage the house. They do not place enough importance on the position of the bath rooms on the second floor, and the kitchen, laundry, etc. The majority of them make the mistake of permitting some architectural motive to dominate the plan, when in reality the architectural motive which is used should be the result of the plan. In other words, the exterior of a residence should express the interior arrangement. There should be no doubt in the minds of those who look at the house that certain tall, long windows open into a spacious living room or music room. The observer should also feel certain that other rooms more modestly placed are used for sleeping quarters.

The style of architecture employed in various locations should be first influenced by the character of its occupant. It should express his or her tastes; whether they lead an active social life, or whether their pleasures consist in a quiet home existence among their children. It is reasonable to presume that those who take an active part in the social life of the community and give entertainments on a large scale, prefer a house which represents their wealth and position in the community. Those of more modest means, who usually have larger families, should be provided with simple, comfortable rooms, ample sleeping porches, and plenty of fresh air.

HOUSE OF MR. LOUIS SONNIKSEN, SAN JOSE
KENNETH MACDONALD, ARCHITECT

HOUSE OF MR. LOUIS SONNIKSEN, SAN JOSE
Kenneth MacDonald, Architect

GARDEN AND FOUNTAIN, HOUSE OF MR. LOUIS SONNIKSEN, SAN JOSE
Kenneth MacDonald, Architect

FRONT ENTRANCE, HOUSE OF MR. LOUIS SONNIKSEN, SAN JOSE
Kenneth MacDonald, Architect

HOUSE OF MR. LOUIS SONNIKSEN, SAN JOSE
Kenneth MacDonald, Architect

HOUSE OF MR. LOUIS SONNIKSEN, SAN JOSE
Kenneth MacDonald, Architect

DINING ROOM, HOUSE OF MR. LOUIS SONNIKSEN, SAN JOSE
Kenneth MacDonald, Architect

HOUSE OF MR. E. A. NICKERSON, CLAREMONT
W. H. RATCLIFF, JR., ARCHITECT

HOUSE OF MR. E. A. NICKERSON, CLAREMONT
W. H. RATCLIFF, JR., ARCHITECT

HOUSE OF MR. E. J. NICKERSON, CLAREMONT
W. H. RATCLIFF, JR., ARCHITECT

HOUSE OF MR. E. A. NICKERSON, CLAREMONT
W. H. Ratcliff, Jr., Architect

Elaborate interior furnishings and finish should be avoided, as it merely curtails the pleasure of the youngsters and makes a continual battle necessary between them and their parents in order to protect the house. To look for comfort instead of ostentation, should be their motto.

The English country house represents the best that is known in domestic architecture, simply because it is the outgrowth of the needs of a constantly increasing family. Good material in the form of heavy masonry is used, and as generation after generation lives in the house, each makes its own improvement and addition, according to its needs. If a certain side of the house commands a beautiful view, and is not subject to the rougher weather, the living room naturally finds its ultimate location there. The original living room becomes devoted to other uses of minor importance. When bedrooms are added, they are placed where experience has taught the occupants that they will receive the best exposure. When the garden is added to the house it is on the sheltered sunny side. In fact, it is in just such a manner that all residences should be built. Far be it from us Americans to take so much time. We would be able to sell and move out of fifty houses in the length of time it has taken to produce one of the old English homesteads, with its garden of mature and well developed plants, and that perfect charm and repose which only thought and care and respect for the beautiful will give.

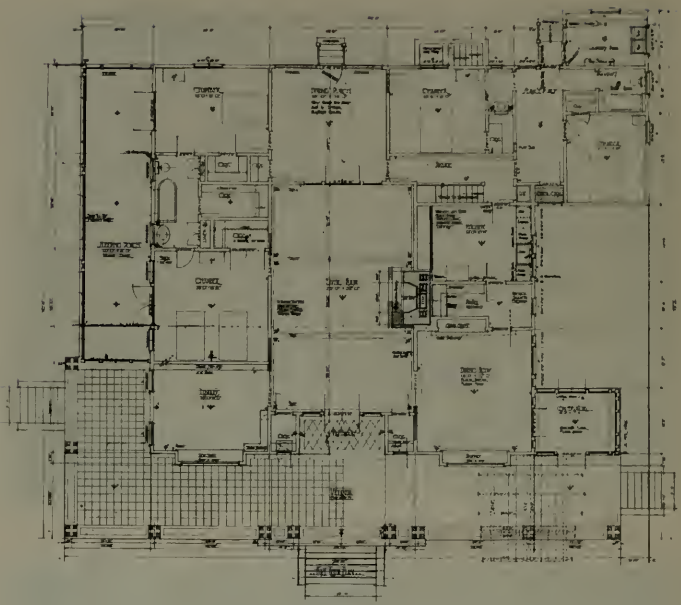
THE accompanying photographs of the home of Mr. John A. Britton at Redwood City show the possibilities of landscape gardening for a simple, shake-covered home occupying a comparatively small piece of land. Mr. and Mrs. Britton have taken a tremendous interest in the beautification of their home and the general plan of the garden and arrangement of the house were carried out in accordance with their ideas. The illustrations are a lesson

BUNGALOW OF MR. JOHN A. BRITTON, REDWOOD CITY
Frederick H. Meyer, Architect

GARDEN, BUNGALOW OF MR. JOHN A. BRITTON, REDWOOD CITY
Frederick H. Meyer, Architect

SUMMER HOUSE AND GARAGE, BUNGALOW OF MR. JOHN A. BRITTON
Frederick H. Meyer, Architect

PORCH, BUNGALOW OF MR. JOHN A. BRITTON, REDWOOD CITY
Frederick H. Meyer, Architect



PLAN, BUNGALOW OF MR. JOHN A. BRITTON, REDWOOD CITY
Frederick H. Meyer, Architect

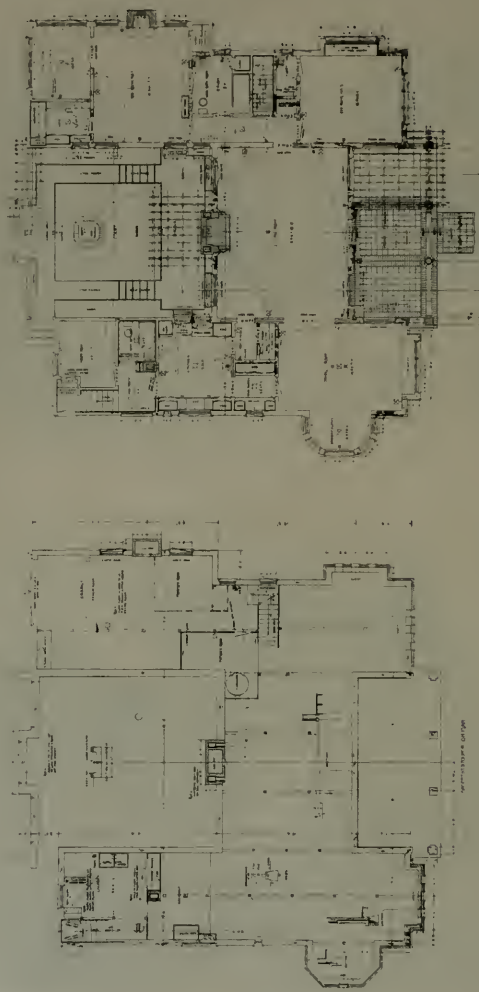
to home builders, inasmuch as few consider the house and garden together, and a country home can never be effective unless the planting of shrubbery and trees is given the most careful consideration in connection with the plan while the house is being designed. The opportunity for a display of individual taste and imagination is here given full sway in the selection of plants and grouping. The Britton home was designed by Mr. Frederick H. Meyer, architect, of San Francisco.

The Somniksen house in San Jose is an example of Spanish and Mission treatment and its splendid lines are given added character by the preservation of stately fir trees and cultivation of shrubbery. The house occupies a conspicuous corner within a stone's throw of the famous Hotel Vendome and is a point of interest to visitors who admire a beautiful home.

Another house of rare architectural design, though of an entirely different type, is the residence of Mr. E. A. Nickerson in Claremont. Mr. William H. Ratcliff, Jr., whose fine work in domestic architecture is familiar to the profession, is the architect. Four pictures of this house are presented, the one showing the facade and gabled roof being particularly charming.

RESIDENCE OF MR. SIDNEY B. NEWSOM, OAKLAND
Sidney B. Newsom, Architect

RESIDENCE OF MR. SIDNEY B. NEWSOM, OAKLAND
Sidney B. Newsom, Architect



BASEMENT AND FIRST FLOOR PLANS, RESIDENCE OF MR. SIDNEY B. NEWSOM, OAKLAND, CALIFORNIA

ELEVATIONS, RESIDENCE OF MR. SIDNEY B. NEWSOM, OAKLAND, CALIFORNIA

Skyscraper with Many Novel Features

ONE of the most unique co-operative apartment houses of which New York city could boast for many years past has been projected for erection on Park avenue, extending from Fifty-first to Fifty-second street. It will embody features that have grown largely from the regulations of the new building code and the necessity for a solution of the servant and living problems, which, it may be remarked parenthetically, are more acute than ever. The plans, which have been prepared by Messrs. Starrett & Van Vleck, call for a structure nineteen stories high and containing duplex apartments ranging from twenty-two rooms or more down to two rooms with bath and pantry.

Above the 150-ft. building line the structure is to terrace back 15 ft. at every two stories, so that the occupants of the duplex apartments above the 150-ft. line will have gardens, pergolas, loggias and out-of-door sleeping porches, which will belong to them exclusively.

The building will not only be an apartment house but a private dwelling and hotel combined, containing all the features which have made the Hotel des Artistes in West Sixty-seventh street—the artist builders' last operation—one of the most successful buildings of the year. There will be a hotel dining room, a ballroom, palm garden, swimming pools, squash courts, and other features for the pleasure, comfort and health of the tenants of the building.

What is unquestionably the distinctive feature is the double service in the matter of cooking. A great kitchen will extend around the rear part of the entire second floor and be connected with every apartment, large and small, by fast-moving electric dumbwaiters. The corporation which will run the hotel and the building will be subsidized by a fixed annual stipend to cook for all the occupants of the building. The tenants may use this service or their own individual kitchens, or both, according to preference. The plan is intended to simplify the servant problem, making it possible to have an elaborate apartment and at the same time be independent of the aggravating servant problem. Another feature will be the service bureau, in charge of a competent matron, where servants in proper livery may be hired by the hour for any purpose. At the very top of the building there will be accommodations for forty specialized servants of this type.

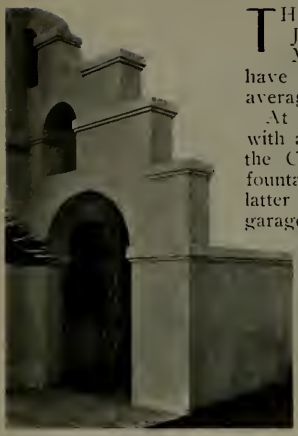
The total cost of the building and the land upon which it will rest is estimated at about $3,600,000. People may buy their apartments in the co-operative structure from $15,000 up to $120,000, according to size and location.

* * *

Lectures on Concrete Practice

The Department of Industrial Education, University of Chicago, and the Extension Division of the Portland Cement Association are co-operating in providing a summer course in concrete, which offers a series of lectures by engineers and teachers thoroughly familiar with the cement industry and the subject of concrete as taught in manual training and vocational courses. The aim of the course is to provide practical and complete information for those who wish to learn the theory and fundamentals of concreting. The lectures—twelve in all—afford instruction in the various phases of concreting practice and provide demonstrations of the proper methods.

Unique Los Angeles Apartments



A Mission Entrance

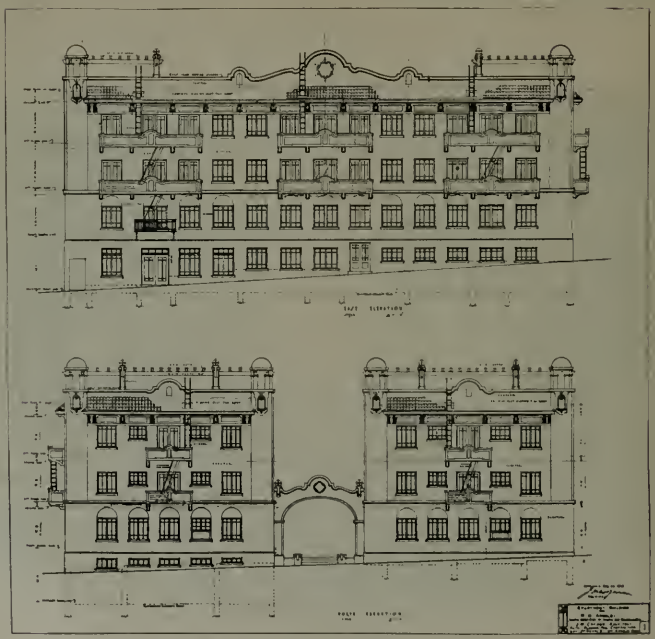
THE Arnold Apartments, Los Angeles, Mr. John M. Cooper, architect, are built in the Mission and Spanish Renaissance style, and have many unique features not found in the average apartment house.

At the end of the court is a Mission fountain with a statue of Fray Junipero Serra, founder of the California Missions. On either side of the fountain is the entrance to the tennis courts. The latter are on the roof of the apartments' private garage. The roof of the garage is constructed of reinforced concrete and is of standard tennis court size.

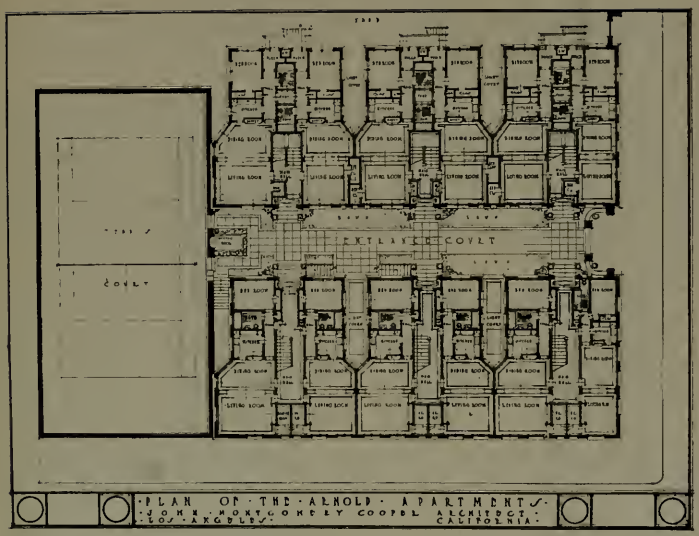
There is no entrance to this court from the street. Instead of entering from the outside, six separate doorways lead from the court. It is one of the few unfurnished apartments on the Pacific Coast. Beautiful Italian cypress extend from the entrance to the fountain on each side of the court. The servants' entrance is in the Mission style and the stairway leading from it serves also as a fire escape. It is the only apartment house in Los Angeles having an individual fire escape for each apartment.

COURT, ARNOLD APARTMENTS, LOS ANGELES
John M. Cooper, Architect

FOUNTAIN AT END OF COURT, ARNOLD APARTMENTS, LOS ANGELES



ELEVATIONS, ARNOLD APARTMENTS, LOS ANGELES
John M. Cooper, Architect



Keeping Reinforcing Bars in Position

The holding of reinforcing bars in proper position while concrete is being placed is a matter which merits the utmost attention. The labors of the best designer and detailer can be set at naught by the carelessness of those in charge of the construction of reinforced concrete structures, while placing steel and concrete.

A designer spends many days designing and detailing a complicated structure, the strength of which can be greatly impaired by comparatively slight displacement of the reinforcement at critical sections. Much time is spent in designing and detailing the reinforcement for a structure, and the all-important matter of getting and keeping the bars in correct position is disposed of by a single note, such as the following: "All reinforcement to be bent and placed as shown on plans and to be securely fastened or tied to prevent displacement during pouring of concrete and to insure proper position of reinforcement in the finished structure." It is left to the discretion of the construction foreman to devise a means of keeping the bars in position, and as a result the strength of the structure may depend on whether the foreman thoroughly understands his business or not.

This is neither good practice nor economy. The method and means of supporting reinforced bars should be clearly indicated on the plans, since they are as important details as the location of bends of bars and stirrups. It is just as important to show the supporting bars, supporting blocks and clips, and the spacing bars as it is to show the main reinforcement in detail. Before the structure can be built it is necessary for someone to devise a means for keeping bars in position during construction, and, as a general rule, a competent designer is more capable of handling these details to good advantage than anyone else.

San Francisco Architects and Artists as Camoufleurs

A RATHER remarkable meeting took place recently at the California School of Fine Arts for the purpose of organizing a committee to be known as the American Camouflage Western Division, with the object of recruiting painters, sculptors, scene painters, house painters and all others interested in the application of protective coloration and devices for the deception of enemies and the rendering invisible of our own forces.

The central organization in New York chose A. Sheldon Pennoyer of San Francisco, who was recently in the East and secured first-hand information from various sources already established, to start the organization of this new war-time activity here. The committee as formed in San Francisco is made up as follows:

Chairman: Mr. Arthur Brown, architect.

Assistant Chairman: Mr. Bruce Nelson, artist.

Secretary: Mr. A. Sheldon Pennoyer, artist.

Executive Members: Mr. John I. Walter, president San Francisco Art Association; Mr. Edgar Walter, sculptor; Mr. E. S. Williams, scene painter Alcazar theatre; Mr. Ralph Nieblas, scene painter Columbia theatre; Mr. Warren C. Perry, instructor in architecture, University of California; Mr. Maynard Dixon, artist; Mr. Lee Randolph, director California School of Fine Arts.

The importance of the invisibility and deception in war is now receiving the attention of the War College in Washington, as shown by information and letters from military authorities now in the hands of the Eastern and Western division of the American Camouflageurs. The plan as outlined by the War College would include a group of 30 or 40 painters to each company of 150 men to be attached to each division. The practice in Europe has grown to such an extent that it is reported 2000 artists have been withdrawn from the fighting units and assigned to the production of special scenery, embracing fake cannons, houses, roads, stacks of ammunition, as well as tree trunks, boulders and dead horses so arranged to contain observers, to say nothing of the battleships and merchant vessels and many other things that the attacking air, land and sea forces of the enemy attempt to destroy.

Activities of this kind have been developed in the United States Navy and first began over a year ago. It has been said that the results obtained by the use of several colors in small squares, maplike patches, serpentine lines and similar methods have rendered our ships more invisible than those of any other navy treated in this manner. With the organizing of the branch of camoufleurs here in San Francisco there will be an opportunity for artists of every description to identify themselves with one of the most important special functions of the war. Membership is open to anyone capable of rendering assistance to the American camoufleurs or of serving as camoufleur. Blanks may be had from the Secretary, the American Camouflage Western Division of the San Francisco Art Institute, San Francisco, or from any member of the committee.

* * *

Rebuilding France After the War

A member of the London Architect staff, writing from the front, states that "no pen can depict the awful desolation out here, gazing at the ruins of ——, somewhere in France. The thought was in my mind at once, what a rush of work for architect, builder and contractor for supplies immediately war is over; will our people rise to this or shall we see the German, who destroyed it, providing the means to restore it?"

A New Working Plant for the First Congregational Church of Pasadena, California

By LEON CARYL BROCKWAY, Architect

Tower, from Water Color Sketch

THE past decade has witnessed a transformation in the Sunday schools of America. In the early part of this period the average Sunday school was a heterogeneous group consisting of an infant class, various classes of young people and a bible class, all considering the same lesson, whether adapted to their needs and understanding or not. From this the successful Sunday school of today has progressed along true educational and sociological lines to the modern graded Sunday school, which is as carefully graded and whose course of study is as thoughtfully prepared as are any of our public schools.

In the properly graded Sunday school will now be found the following departments: Cradle roll, beginners, primary, junior, intermediate, senior and adult. For the most successful working of these departments, most of them require suitable rooms for their exclusive use and some of them need special equipment.

These new requirements of the Sunday school have made corresponding demands upon the church buildings of the country which most of them have failed to adequately meet. Of course, the Sunday school rooms of the older church buildings built before the graded school movement began are inadequate: some have been remodeled, some torn down and new buildings erected. The great demand of the progressive Sunday school workers of the country is for adequate rooms in which to carry on this mighty educational work which is the hope of the church of tomorrow. This working plant of the church, as we may well call it, is not necessarily of great expense; it is rather a question of proper planning with a clear idea of the requirements.

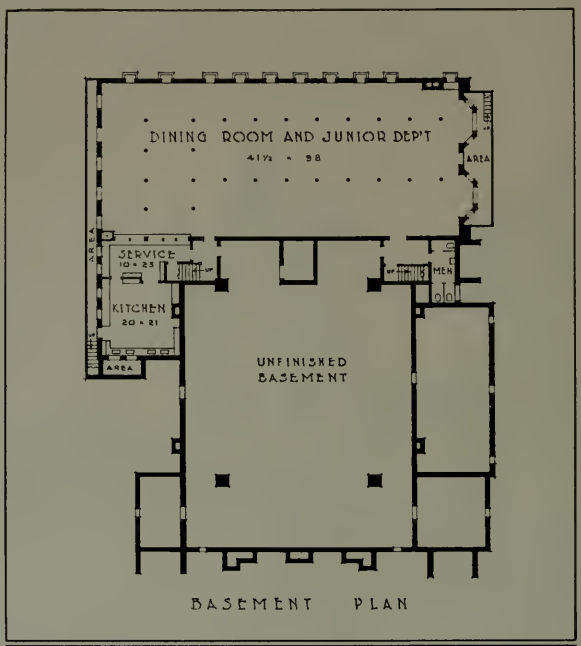
The Sunday school of the First Congregational church of Pasadena, California, is a specific example of this evolution of the Sunday school. This church, built in 1904, was adequate at the time, but in 1916 the increase in membership and the adoption of modern methods made more room imperative both for the Sunday school and the social interests of the church.

Main Entrance. Buchanan & Brockway Architects

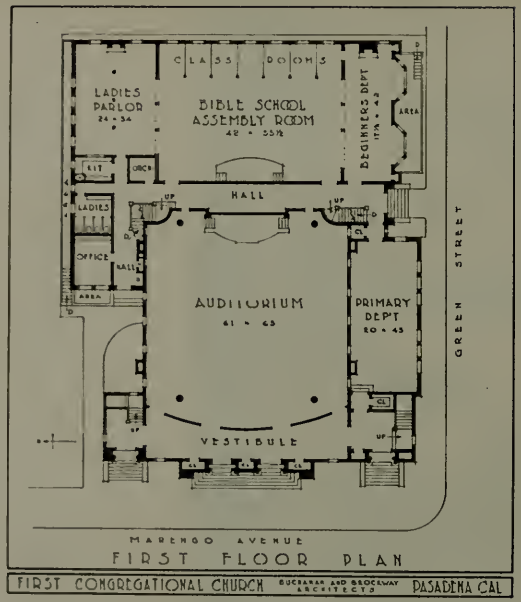
VIEW FROM SOUTHWEST, BEFORE ALTERATIONS
FIRST CONGREGATIONAL CHURCH, PASADENA
BUCHANAN & BROCKWAY, ARCHITECTS

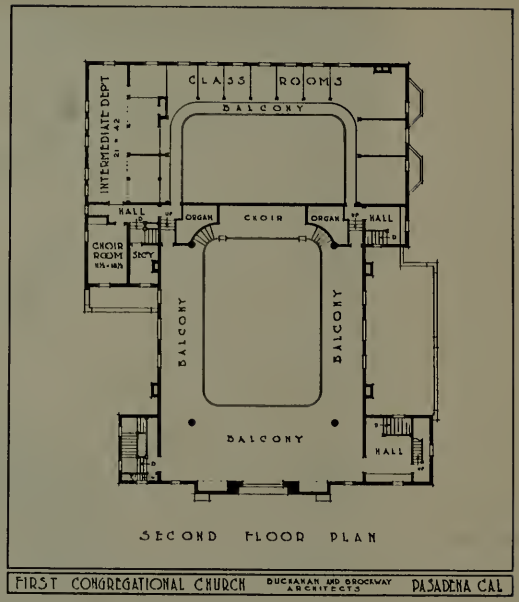
VIEW FROM SOUTHWEST, AFTER ALTERATIONS
FIRST CONGREGATIONAL CHURCH, PASADENA
BUCHANAN & BROCKWAY ARCHITECTS

The planning of the alterations and additions was intrusted to Messrs. Buchanan & Brockway, architects of Pasadena, and their solution of this problem—for, owing to the limitations of the lot and certain unchangeable features of the old building, it was, indeed, a problem—has produced a church building which in the plan and equipment of its working plant has been pronounced the equal of any in Southern California.



The arrangement of the various rooms and departments is clearly shown in the accompanying floor plans. Referring to the first floor plan, we find the rooms of the beginners and primary departments on the Green street frontage on each side of the entrance. These are large, attractive rooms and, being on the south side, the little folks have the advantage of sunshine and sea breeze. They are well provided with closets for equipment and supplies. On the north side of the building we find the principal Sunday school entrance. Just inside the door is a sanitary drinking fountain; on the left the church office. The north end is devoted to the ladies' interests, there being a white enameled dressing room, kitchenette with dumb-waiter connecting with large kitchen below, and a spacious parlor with fireplace. The large glass paneled sliding doors which have been introduced on each side of the assembly room make possible a clear open space nearly one hundred feet long,


CLASS ROOMS
LADIES PARLOR
24 × 34
BIBLE SCHOOL ASSEMBLY ROOM
42 × 55½
BEGINNERS DEPT
17½ × 42
AREA
KIT
ORCH
HALL
LADIES
OFFICE
AUDITORIUM
61 × 65
PRIMARY DEPT
20 × 45
GREEN STREET
VESTIBULE
MARENGO AVENUE
FIRST FLOOR PLAN
FIRST CONGREGATIONAL CHURCH
BUCKHAM AND BROCKWAY ARCHITECTS
PASADENA CAL


CLASS ROOMS
INTERMEDIATE DEPT
BALCONY
HALL
ORGAN
CHOIR
ORGAN
HALL
CHOIR ROOM
SKY
BALCONY
BALCONY
BALCONY
HALL
SECOND FLOOR PLAN
FIRST CONGREGATIONAL CHURCH
BUCKHAM AND BROCKWAY ARCHITECTS
PASADENA CAL

VIEW FROM NORTHWEST, FIRST CONGREGATIONAL CHURCH, PASADENA
BUCHANAN & BROCKWAY, ARCHITECTS

for Sunday school assembly and also for social purposes. A useful feature on this floor is a large closet for the music and instruments of the orchestra, which is quite a feature in this school and possesses much valuable equipment.

On the second floor a curved balcony surrounds the assembly room on three sides, back of which are class rooms for senior and adult classes, while at the north end is a large club room and adjoining class rooms for the intermediate department. Glass folding doors permit these class rooms to be opened through to the balcony. Opposite the intermediate rooms is the music and robing room for the choir. Opening onto the stair landing is the library and secretary's office. An electric call-bell is installed in each department for the use of the superintendent.

There is a basement under the entire Sunday school portion of the building, most of which is in one big room. Owing to the large area and wide bay windows on the south end, this room is well lighted and ventilated and is finished all in white. On Sunday it houses the junior department of the Sunday school and at other times is used for social and dining purposes. Adjacent to the north stair hall we find the serving room and kitchen. They are finished in white enamel and the kitchen is equipped with modern hotel type ranges, ovens and coffee boilers, sufficient to serve the full capacity of the dining room.

While the necessity for increased space was the prime cause for this enlargement, advantage was taken of the opportunity to improve the architectural appearance of the exterior.

The original building was covered with wooden siding, with many useless mouldings tacked on. The additions, to comply with the building code, had to be of brick construction. The superfluous mouldings were removed, the woodwork covered with metal lath and the whole exterior plastered. This, with the removal of the spires and the addition of suitable cement stone columns and arches at the entrances and engaged shafts on towers and buttresses, wrought a transformation to the building and it emerged from the ordeal to all appearances a new and modern structure. The First Congregational church is now worthy of architectural consideration in keeping with the place occupied by its people in the religious and social life of Pasadena.

*
* *

Concrete Circular Chimney

A reinforced concrete circular steel chimney 207½ ft. high from the bottom of the footing and tapered from a diameter of about 17 ft. at the base to 12 ft. at the top was recently built at Agnew, California, for about $12,000, including the pile foundation and the concrete base 35 ft. in diameter, and 10½ ft. below the surface of the ground. A concrete shell about 12 in. thick at the base and 5 in. thick at the top was cast at the rate of one course per day in outside form 7 ft. 9 in. high made of sheet steel adjustably secured to exterior circular rings and having the vertical edges overlapping so that they could be adjusted to taper to correspond with the diminishing diameter as the form was moved upward. The inside forms were each made of four semi-circular pieces each 3 ft. 9 in. high with the vertical joints staggered.

The Housing Aspect of the City Planning Problem*

By PAUL SCHARRENBERG†

UNFORTUNATELY the term "City Planning," as popularly understood in America, does not appear to have much in connection with housing. This is probably due to the fact that the term suggests the mere embellishment of the external features of the town or city, such as the architectural aspect of its buildings, the beauty or scenic effect of its streets, or the efficiency of its transportation, and does not convey any idea of the extent to which it enters into the fundamental aspects of the city's life and growth. This impression may have become prevalent because the sort of city planning that has been practiced, particularly in Germany and the United States, has concerned itself for the most part with the external and grandiose in city development.

But whatever the reason, it is an error to assume that city planning concerns itself solely with any one thing connected with either the improvement of a city's external aspects, its sanitation or its transportation. It really covers everything connected with the city and concerns itself with everything that has to do with the health and well-being of the citizens. This has been most clearly pointed out by Thomas Adams, the housing and city planning advisor of the Canadian Commission of Conservation. As he has ably demonstrated, it is imperative that, in planning ahead, emphasis be placed on plans to insure an ample supply of wholesome homes for future residents. This aspect of city planning may be termed a constructive or preventive housing program, as distinguished from the purely restrictive or remedial housing programs or measures.

The reports of the State Housing Commission have clearly demonstrated that bad housing conditions already exist in San Francisco and other cities of California. It is imperative, therefore, to restrict the existing bad conditions and also to plan wisely and sensibly ahead to prevent the growth of greater housing problems in this new and rapidly developing State.

Careful plans for streets, parks, playgrounds, public buildings will avail nothing if the people, particularly the great mass of workers, are housed in insanitary, crowded, poorly lighted and unattractive tenements and shacks. This is not a matter of any one city only. The health and general welfare of the whole State depend upon and are contagious to the health and welfare of each local community. Therefore the last Legislature authorized the State Commission of Immigration and Housing to encourage the formation of local city planning commissions and to bring about helpful co-operation among the city planning commissions of the State, of which there are today eighteen. The State would like to see a city planning commission at work in San Francisco. We know that such a commission would do research work of the greatest value to the city—work not now done by any existing city department and which should be started soon, as a war measure of economy, conservation and municipal order.

Such a commission would be only advisory, it is true, but nearly two hundred and twenty cities of this country are getting most constructive help from such advisory commissions today.

As a first step in seeing to it that housing is included in the scope of activities of every city planning commission, the State Housing Commis-

* Address to the Commonwealth Club of California, San Francisco, June 16, 1917.
† Secretary State Federation of Labor and member State Commission of Immigration and Housing.

sion is to use its newly acquired authority with these commissions to insist on attention to the housing problem. The State Commission will attempt to get the various local city planning commissions to so lay out and zone new additions to a city that housing for workers shall be provided within a reasonable distance from manufacturing and working centers, to uniformly provide restricted residence zones or areas under the new State zoning law, so that every resident will be provided with as much yard room or vacant space as possible free from the encroachment of industry, and finally to aid and encourage public and private enterprises in supplying real homes for laboring people, adapted to their needs in price and location. In Philadelphia, Cincinnati and Washington attractive workingmen's homes have been built and are available at a rental from $7.50 to $12.50 per month. In this city and elsewhere in our State workmen are paying much higher rents for unattractive, insanitary dwellings. Certainly with California's vast areas of vacant lands, with no such congestion as exists in the cities named, we should be able to have attractive homes for workers at even a lower rental.

As the second step dealing with the housing phase of the city planning problem, the State Housing Commission will bring every possible pressure to bear upon local officials in enforcing the three new housing laws which were passed by the recent Legislature. These laws would probably come under the general classification of restrictive or remedial measures, although they are essentially preventive or city planning measures, inasmuch as they provide for the proper construction of dwellings with regard to both land congestion and ventilation or sanitation. They apply to hotels, tenements, and all other dwellings which house less than three families and which are not included under the tenement house law. The laws were carefully prepared by a Housing Institute, which was made up of building inspectors and health officers as official delegates from the fourteen largest cities of the State, and of representatives from realty boards, hotel men's associations, building contractors, social workers, etc.

The tenement and hotel laws are great improvements over the former laws covering these classes of buildings in that they are much clearer in form and more effective in providing for satisfactory yards, courts and other unoccupied areas, as well as preventing inside sleeping and living rooms. The maintenance provisions which apply to existing buildings give local health officials adequate power to require proper sanitation and cleanliness. The new dwelling house law was amended by the Legislature so that it applies only to incorporated towns and cities. It is a very short and simple law, but is a decided step forward in city planning in that it prevents lot and land overcrowding by requiring that every room in a dwelling must open on to either a public street or other unoccupied areas at least four feet in width and containing thirty-six square feet. This will prevent the jamming of one house against another on the lot lines—a thing that has been so prevalent especially in the two family flat houses in San Francisco.

These laws go into effect on September 1st and the State Commission is given power to enforce them where the local authorities fail. The prospect is hopeful, therefore, for an intelligent and uniformly strict enforcement of these acts, but it is essential that selfish and unenlightened interest should not be permitted to successfully oppose the operation of these laws or weaken them by amendments in the future. It is essential that people interested in the other aspects of the city planning problem should keep clearly in mind that probably the most human phase of this field is

housing. If we do not, either by force of law or education, provide proper housing or homes for the people, the improvement and beautification of the exterior features of the city will avail nothing.

City planning means more than building a great and expensive civic center and the city which does not recognize this goes backward. We want city planning in San Francisco for the poor man, a permanent commission appointed now to study one of the biggest and hardest problems of the world today—right city growth.

Mayor Rolph has already made a splendid record. It is doubtful, however, whether he could leave the city any greater heritage of a constructive administration than to name this body and start it upon this great and necessary work.

* * *

Masonry and Our Architecture

ONE of the Italian commissioners now on a war mission to this country, Signor Arlotta, made a plea before the Merchants' Association of New York that this country aid the allies in the most needed way by the building of ships. Signor Arlotta suggested that if we could "not furnish iron for both ships and for skyscrapers, we should for a time at least cease to build skyscrapers."

This has formed the text for an extremely interesting letter to the public press by Mr. Cass Gilbert, the eminent New York architect, who says:

"We have been perhaps extravagant in America in the use of structural steel for building work. There are hundreds of buildings erected in this country every year which could be just as well erected without steel, and in hundreds of others the amount of steel could be greatly reduced. An enormous tonnage could be saved if reinforced concrete, masonry, or other material was used. Practically all buildings of moderate height can be erected without the use of large quantities of structural steel. Reinforced concrete or old-fashioned masonry can take its place, and for a time at least we could well forego the erection of buildings of excessive height. The architects and engineers of America have ingenuity enough to meet our building problems along these lines if they must, and if the owners of prospective buildings will adapt their views a little to the practical conditions of masonry and concrete there is no reason why we should not in the end have even better and more substantial buildings for all structures of moderate height."

Mr. Gilbert then adds that he one time made the jesting suggestion that we might be forced eventually to destroy our skyscrapers in order to utilize the steel they contain in other ways. The time may come, he says now, and may not be far distant, when this prophecy, spoken in jest, will be realized.

Mr. Gilbert does not think it will be altogether a misfortune if we curtail our steel construction. He says: "Our architecture will not suffer for it, and if it did we can wait to remedy that. The greatest architecture the world has ever known was built of masonry and concrete. Vast spaces were vaulted, vaster, perhaps, than any we now build, and far more enduring. The Baths of Caracalla and of Diocletian, the Pantheon in Rome, the Dome of St. Peter's in Rome, the Mosque of Santa Sophia in Constantinople, all spanning great distances, were built of masonry. The great cathedrals in France and England were vaulted with masonry. Certainly

no more dignified and imposing buildings were ever built. The floor construction of the earlier buildings in our own country, such as the old section of the Treasury Department and the older portion of the National Capitol, was vaulted masonry. In Italy and France, in our own time, it has been the custom to construct floors of concrete or masonry vaulting, and should we return to these methods of construction we would develop an architecture more substantial and more imposing than anything that we can construct of steel.

"The use of the timbrel arch construction, as in the Boston Public Library, the Hall of Fame of New York University, the Cathedral of St. John the Divine of New York, the Capitol Building at St. Paul, and the elliptical 'rotunda' of the United States Custom House in New York, are examples of what can be done in wide-span construction, practically without the use of steel, the dimensions of the last-named vault being 86 feet in its minor axis and 126 feet in its major axis. A great number of other examples of recent construction, such as loft buildings, office buildings, warehouses, and factories from five to ten stories in height, have been erected entirely in concrete in various parts of the United States, and show that Americans can build and build well without structural steel. Viaducts, bridges across broad rivers, and culverts almost without number have been built in this country practically without steel. The great bridge of the Great Northern Railroad across the Mississippi at Minneapolis, that of the Pennsylvania Railroad at Harrisburg, the viaducts in the Borough of Queens, all of concrete or masonry.

"There are, of course, certain practical considerations of economy of space, which we cannot fulfill always quite as well in certain kinds of buildings without the use of structural steel, but there is no reason why our people should not change their requirements, if necessary, to meet war conditions, and if they are willing to do so it would be greatly to the advantage of architecture as a fine art."

* * *

Promoting the Flow of Concrete in Pipes and Forms

IN the $3,500,000 Twin Peaks tunnel, recently completed in San Francisco, the contractors, R. T. Storrie & Co., were successful in conveying concrete 4,000 ft. through an 8-in. pipe by the pneumatic placing process.

This concrete was mixed with hydrated lime added for a lubricant which acts through its ability to hold water and prevents segregation, thus allowing the concrete to be mixed wetter than would otherwise be satisfactory.

In a recent letter to Mr. Pierre N. Beringer, publicity manager of the Ransome Concrete Machinery Co., Mr. M. M. O'Shaughnessy, city engineer of San Francisco, under whose direction the tunnel was constructed, wrote: "I believe the conveyance of concrete by pipe is a great achievement and the interesting part of the work is that it carries uphill on a 3 per cent grade better than on the down grade. The reason for this is, I presume, that the material acts like a wad in a gun and is pushed forward in a mass on the uphill grade, whereas on the downhill grade it is scattered.

"Experiment at other points in the mixing and placing by the use of pneumatic machinery has demonstrated the value of the use of hydrated lime beyond a doubt both as an aid in reducing friction in transit of the aggregates as well as improving the quality as to waterproofing."

INTERIOR OF CHURCH NEAR FLORENCE, ITALY

San Francisco Engineer Criticises Amended Architects' License Law

MR. E. T. THURSTON, a San Francisco constructing engineer, and secretary-treasurer of the San Francisco Association of Members of the American Society of Civil Engineers, recently addressed two communications to Engineering and Contracting, an Eastern technical journal, one of which, at least, has aroused the ire of California architects. It is a criticism of the recent amended Architects' License Law, which failed of passage during the late session of the State Legislature. Mr. Thurston's communication and an outline of the proposed new law, which probably will come up again for passage at the next session of the Legislature, follows:

Proposed New Architects' License Law of California

In view of the movement in various parts of the country to control the practice of structural engineering and architecture by means of licenses imposed by political boards, I have thought your readers might be interested in the form which such a movement assumed in California before the Legislature recently adjourned. I, therefore, enclose a copy of Assembly Bill No. 1126 in the amended condition in which it finally emerged from the Assembly Committee on the Judiciary, together with an abstract of the same prepared for the convenience of a committee appointed by the San Francisco Association of Members of the American Society of Civil Engineers to oppose the passage of the measure.

The bill as proposed by the architects and as originally endorsed, provided that no buildings, except single-family dwellings, should be constructed in California unless designed, specified and superintended by a certificated architect, admitted all architects licensed under the existing law to a new license under the new law, and prohibited anyone from even taking the examination for a certificate unless he had for five consecutive years been in the employment of an architect.

The opposition of this Association to the measure was unconditional and based upon principles long since enunciated by the American Society of Civil Engineers, but the bill met with a variety of special opposition, such as of contractors, or speculative builders of frame flats and apartment houses, agricultural, mining, lumbering, petroleum and public service interests, and the engineering and architectural schools and colleges, which discovered that their graduates would not be distinguished from office boys and others employed by architects with no preparatory training.

It was manifestly impossible to meet the objection of the engineers to submitting to the control of an architectural board in the practice of their profession without robbing the measure of its real purpose—which it will be recognized is not to provide for the public safety as stated in its title—but persistent attempts were made to meet other objections, thereby rendering the measure so ludicrous from the standpoint of public safety as to make it interesting reading. This will explain special exemptions noted in Section 5, the complete capitulation to the spirit of theoretical education in Section 6, the exemption of pretty nearly every interested party except future architects and engineers in Section 7, with special reference to the most objectionable of all, the speculative builder, and the exemption of all public work, Section 9. The bill was introduced and argued solely as a public safety measure, and, although evidence was overwhelming that architects almost invariably had to engage the assistance of practicing structural engineers to insure the safety of buildings of any importance, its proponents flatly refused even to consider a suggestion made by one of the legislators that the examining board be constituted equally of structural engineers and architects.

It may be that the movement for regulation of private enterprise may ultimately extend in drastic measure to the engineering and architectural professions, but in the interest of the innocent public it should be made clear that safety in building construction cannot be insured by examining the designer and ignoring the design. It is the opinion of local engineers that a state building code provided with machinery to enforce it would constitute the simplest and most effective means of insuring safe construction. As a matter of fact, however, there was practically a total failure on the part of the proponents of the measure in question to adduce any evidence of unsafe construction in California. This is not to say that none exists, but that public life has not in general been noticeably in danger. At any rate

there should be strong opposition among engineers to being licensed or in any way controlled in the practice of their profession by architects, who have yet to show themselves, as a class, noticeably competent in matters of safe construction.

Very truly yours,

E. T. THURSTON,

Secretary-Treasurer San Francisco Association of Members of the American Society of Civil Engineers.

San Francisco, Cal.

Outline of New Architects' License Law (A. B. 1126) Entitled

An Act Providing for Public Safety in Buildings within the State of California by Regulating the Construction, Alteration and Repair of Same, Providing for the Appointment of a Board to be known as the "State Board of Architecture," prescribing the Powers and Duties of Said Board, and to Provide Penalties for Violations of the Provisions Hereof.

Section 1. Provides for new State Board of Architecture of seven members composed of

4 certificated architects,

2 structural engineers,

1 teacher of structural engineering.

Sec. 2. Organization of Board; regular meetings in S. F. in April, in L. A. in October; Board shall adopt necessary rules; report annually to the governor, which report shall include financial statement, code of rules in force and a complete directory of holders of certificates; report to be printed and mailed to holders of certificates. The Board is empowered to employ "executive officers, deputies, attorneys, examiners, inspectors, clerks and other assistants as needed," fix their compensation, remove, demote and promote them and fix their duties, to rent, furnish and maintain necessary offices, and to enforce the act.

Sec. 3. Members of Board serve without compensation, but shall be reimbursed for necessary expenses incurred. Expenses to be paid out of fees collected; excess moneys over a working cash balance of $1,500 to be turned over to the State treasurer.

Sec. 4. Defines the term "structural engineer."

Sec. 5. Prohibits the construction or structural alteration of buildings unless "designed, specified and supervised or superintended" by a person certificated hereunder as "architect" or "to design and superintend the construction of buildings" and who has endorsed by his signature each of the drawings and specifications or reproductions thereof used in connection with such work.

The following classes of buildings are exempted from the provisions of the law:

(a) Buildings used in connection with farming, mining, logging, lumbering, petroleum works, electric or water power plants, water supply, irrigation or sewage disposal.

(b) All single-family dwellings.

(c) All buildings of not over two stories, not used for public assemblage.

(d) All frame buildings of not over three stories, not used for public assemblage.

Sec. 6. Applicant for examination must have had practical experience in designing or supervising buildings, 5 years for structural certificate, 6 years for architectural certificate; credit for college study is accorded as follows:

For one year's study—six months' practical experience.

For two years' study—one year's practical experience.

For three years' study—three years' practical experience.

For four years' study—five years' practical experience.

Fee for structural certificate, $50; fee for architectural certificate, $75.

Sec. 7. Examinations. The applicant for a certificate "to design and construct buildings" must pass examinations in the following:

(a) Structural engineering "to insure that the applicant has a solid theoretical understanding and a working knowledge of the principles and mathematics involved in the computing of all stresses and strains in the mechanics of building operations."

(b) Theory and practice of sanitation of buildings and ability to design plumbing systems.

(c) Theory and practice of heating and ventilating of buildings.

(d) Stereotomy.

(e) Practical electricity.

(f) Fire protection of buildings.

(g) Specification work.

(h) General education and knowledge of architectural forms.

An applicant for a certificate as "architect" must in addition be examined in the following:

(a) Elements of architecture.

(b) Architectural design.

(c) History of architecture.

(d) Free-hand drawing.

(e) History of ornament.

(f) Shades and shadows, and use of color.

Persons will be granted certificates without examination, as follows:

(a) Holders of certificates from another state or persons of 10 years' experience in places not requiring certificates, on payment of fee of $10, a certificate fee and current annual license fee.

(b) Structural engineers in independent practice, on payment of $5 certificate fee.

(c) Any person submitting photographs and specifications or plans and specifications of one or more buildings in California, designed by him or by persons employed by him, and erected under his supervision, on payment of $5 certificate fee.

(d) Architects certified under the present law, on payment of $5 certificate fee (but the following paragraph provides for the perpetuity of the old certificates without extra charge).

Sec. 8. Annual license fee is fixed at $5 and causes and conditions of revocation are specified.

Sec. 9. Exempts public work from the provisions of the act by permitting regular public officials and employes as such to design and superintend buildings without certificate, but providing that all special employes in such connection must be holders of certificates under the act.

Sec. 10. Safeguards act against possible decision that portions are unconstitutional.

Sec. 11. Repeals the present law entitled "An Act to Regulate the Practice of Architecture."

* * *

Final Figures of Cement Production in 1916

Complete statistics covering the Portland cement industry in 1916 show that the production, 91,521,198 bbls., was second only to that of the record year 1913, when 92,097,131 bbls. were manufactured. The shipments in 1916 were 94,592,296 bbls., valued at $100,014,882—a new record of valuation.

Higher prices for cement prevailed throughout the United States in 1916, except at a few places where top prices were realized in 1915. The average factory price per barrel in bulk at mills was $1.058, compared with $0.860 in 1915, an increase of 19.8 cents, or 23 per cent.

The combined production of natural and puzzolan cements in 1916 was 842,137 bbls., valued at $430,874, compared with 793,541 bbls., valued at $398,428, in 1915.

These statistics, compiled by Ernest F. Burchard, of the U. S. Geological Survey, Department of the Interior, are based on returns from every active plant in the United States and differ from the estimated figures, published earlier in the year, by only .04 to 0.4 per cent.

Accidents on Construction Work

IT is cheaper and better in every way to prevent accidents than to pay for them. This is quite as true for the employer as for the employee, for, although the latter suffers the pain, the employer pays compensation, loses the services of a skilled laborer for a period, loses the profit on the man's work and in general has his organization disarranged. Therefore, every accident prevented is added profit.

In an article in the Engineering News-Record, Mr. J. J. Rosenthal, safety engineer to the Industrial Accident Commission of California, tells of accident prevention possibilities on construction work in California. He calculates that fifty per cent of construction accidents are preventable, which in this state alone would mean a saving to employers of about one and three-quarter million dollars a year. Mr. Rosenthal says:

Although much attention has been devoted to accident prevention on railroads and in manufacturing industries, practically no safety precautions have been enforced on construction work. There seem to be two reasons for this lack of attention: That the work is of a temporary character and that the worker is injured in most cases by falling or being struck by some object falling from above.

From the standpoint of the safety expert, construction work can no longer be classed as a temporary industry. Safety precautions are necessary and are applicable regardless of the duration of the construction period. The worker can be protected in large degree from the danger of falling by the provision of substantial scaffolds, stagings and flooring, at the same time that similar safety measures can afford him sufficient covering to protect him from objects falling from above.

California is pioneering in the enforcement of safety regulations in the construction field. Three years ago, with the advent of the Workmen's Compensation Insurance and Safety Act, it was required that all places of employment indoors or outdoors, above or below ground, should be made safe. The Department of Safety of the Industrial Accident Commission has engaged in a vigorous campaign to carry out the provisions of this act, and an organization has been developed for the inspection of construction work and the investigation of accidents that occur during its progress.

An analysis of accidents in connection with this work has led to the compilation of the accompanying accident table, covering all classes of construction work. The table shows a considerable reduction in the number of accidents in 1915 and an increase in 1916. This is because 1914 and 1916 were marked by greater construction activity than the intervening year. Comparing the figures for 1914 and 1916, however, shows the actual reduction of accidents which can be attributed to rigid inspection and the adoption of methods for safeguarding the worker.

Table Showing Injuries Sustained on Construction Work in California

Class of Accident (See note next page)	Fatal			Serious			Slight		
	1914	1915	1916	1914	1915	1916	1914	1915	1916
A	50	34	40	19	16	15	1,635	1,652	1,678
B	72	47	60	166	146	161	3,415	2,225	2,769
C	17	13	12	11	16	15	5,359	6,988	6,040
D	14	12	13	29	23	26	91	164	141
E	12	12	11	13	9	11	763	987	904
Totals	165	118	136	238	210	228	11,263	12,016	11,532
Grand Totals		419			676			34,811	

Note—Class of accident is as below:

A.—Injuries resulting from the lack of shoring and bracing of tunnels, trenches, excavations or sheeting or sheet piling of treacherous ground.

B.—Injuries resulting from the collapse, tipping or falling of scaffolds, stagings, ladders, walls, and all false work, due to inadequate support, flimsy construction or defective lumber or overloading of same. Included in this group also are injuries resulting from falls into unguarded floor openings, elevator shafts, or due to lack of flooring in buildings or other structures in course of construction. (Nine of the accidents listed were due to pile drivers and bulldozers in 1914, and 18 similar accidents occurred in 1915.)

C.—Injuries resulting from the falling of material which has been previously piled or which is in the course of being piled and which falls due to improper foundations or due to being improperly piled.

D.—Injuries due to careless storing or handling of explosives.

E.—Injuries resulting from the overloading or overstraining of ropes, cables, or slings which are used in all class of hoisting apparatus, such as derricks, cranes, etc.

From the average amount paid for compensation and medical fees per accident, it is computed that the 419 fatal accidents for the three years cost $460,900; the 676 serious injuries, $498,043; the 34,811 slight injuries, $811,096.30, making a total of $1,770,039.30. The slight injuries resulted also in the loss of 591,787 days. Converting these figures into 300-day years, gives a total loss of 1,972 years. Assuming the average annual earnings for each man as $900, the loss sustained by these men amounted to more than $1,750,000.

It is the general opinion of the engineering profession that half of the accidents which occur are preventable. If the compensation and medical fees alone could have been reduced 50 per cent, $885,019.65 would have been saved to the employers of California in the past three years. Then, too, if one-half of the accidents were preventable, 210 lives might have been saved and the wage earners in 210 families would still be at work providing for those dependent on them.

Adequate safeguarding would also reduce the rate on compensation insurance premiums which under present conditions is exceedingly high, just as fire insurance is materially reduced for those who take steps to safeguard against fire. Most of the accidents represent a great economic and social waste, for the cost of safeguarding is very slight.

To give some illustrations: The twelve-story Santa Fe building recently constructed in San Francisco, a structure 45x90 ft., costing $350,000, involved the following costs for safety measures: Five temporary floors used by the steel erectors, to protect them from falling and as a protection from falling materials, at $111.76 per floor; twelve double ladders at $1.50; 135 ft. of suspended safe scaffolding, used by bricklayers, at 33 cents per foot; a 5x5-ft. tower, 196 ft. high, with cage for hoisting materials, at $1.25 per ft.; guarding 24 openings, 6x14 ft., for elevator shafts and stairways, with railings 3 ft. 6 ins. high, at $1.50 per foot; 135 ft. of temporary enclosed sidewalk at $1 per foot.

The total cost of safeguarding 175 workers who were engaged in building this structure for a period of six months was $1,032.35, or $5.89 for each worker. If a fatal accident had occurred to a laborer it would have cost the contractor $2,700 for compensation; or if a mechanic had been killed, it would have cost $5,000. These sums of money represent only the economic loss. They would not pay for any life, nor relieve the mental sufferings of those dependent upon the worker. Past statistics show a fatal accident for each story above the tenth on a building over ten stories high. On the Santa Fe building, however, there was neither fatal accident nor permanent injury and only one slight accident.

Taking an example from another class of construction: A sewer system involving 30½ miles of 8 to 30-in. vitrified and concrete pipe placed at depths from 5 to 18 ft., and costing $250,000, was completed at Stockton and Hanford by Chambers & Heafey, general contractors. The cost of bracing, shoring and sheeting this work was $12,000. About 3,500 men were engaged on this work for a period of twelve months, and no fatal accident or permanent injury occurred and there were only a few slight injuries. Such results as these are accomplished through careful and frequent inspections by safety engineers and co-operation of employers and employees.

Considerable difficulty has been met with in inducing contractors to safeguard construction work. There seem to be several reasons for this. First, the keen competition in bidding causes contractors to disregard calculations for safety in order to offer the lowest bid. Such employers object to the expenditure of any money for safeguarding on the ground that they did not figure on it in their bids.

Second, the constant changes in the nature of the work as construction progresses make each stage so temporary that the contractor is tempted to evade safety provisions such as bracing and shoring excavations and providing rigid scaffolds, falsework, etc. He argues that it does not pay for such a short time. Third, the speed and high pressure under which most construction work is carried on cause the contractor to avoid anything which seems to him to retard the progress of the work.

Fourth, the workmen themselves are often averse to bothering with safeguards. In their impatience to get ahead they will often use weak material because it happens to be nearest at hand. The writer has seen the use of six-penny nails instead of 20-penny nails, 1-in. boards instead of 2-in., defective lumber used on scaffolds and falsework, and general experience in California bears out the truth of the statement that 50 per cent of accidents can be prevented.

On the whole there has been a considerable decrease in serious and fatal accidents on construction work in California since the safety department began its "Safety First" compaign. Contractors are realizing that it pays. For example, when a scaffold or any falsework collapses there are five distinct effects: (1) The direct injury to the person or persons who fall; (2) the psychological effect on the workers who witness the accident and loss of efficiency therefrom; (3) the delay due to the temporary cessation of work and the necessity of rebuilding the structure; (4) increased cost of the work and the compensation and hospital fees of the injured; (5) the increased cost of insurance if such accidents occur repeatedly or a big loss if not insured. Much has been done in this field in California but there is still much to be done in the way of educating both the employer and the employee in the "Safety First" movement.

In line with its policy of extending supervision to all fields of construction, the Department of Safety of the Industrial Commission last year undertook to draft a safety code which would effectively cover the construction field. At first there was prepared a tentative draft of general construction safety orders. This was submitted to a committee in San Francisco composed of representatives of engineering organizations, the general contractors, architects, board of public works of the city, and the Building Trades Council of the state. After being passed upon by this committee, the orders were referred to a similar committee in Los Angeles. In revised form, but before final adoption, they are now being sent to contractors, engineers and architects throughout the state for criticism

and suggestion. The ultimate purpose is to have the safety orders embodied in a state law.

Meantime, the draft of the safety orders in the present form is being enforced by the commission. If any employer considers the provisions unreasonable he may petition the commission for a hearing, after which if the order is found to be unreasonable, the commission is required by law to substitute such other order as may be deemed just and equitable.

As now revised, the safety orders cover all branches of construction, with detailed provision for safety measures that must be observed on each class of work. The orders require the protection of workmen in trenches, on scaffolds, when working underneath superstructures, and the use of temporary floor planking and safety nets in structural work and the guarding of openings between floors. Detailed attention is given to the methods in which workmen may handle explosives, the demolition of buildings, the piling and storing of materials, and in fact wherever personal risk is involved.

* * *

Tree Surgery in France

"TREE SURGERY" is an art which has been better developed in France than in this country, and it is fortunate that so much attention has been paid to it. For, as a consequence, thousands of fruit and other trees are now flourishing which the Germans, in their lust for destruction, essayed to destroy. When the close pursuit of the French armies gave the Germans insufficient time in which to completely cut down the trees, the vandals cut off a circle of bark around the trunk, well knowing that a few days' exposure to the sun would be sufficient to kill peach, plum, apple, apricot and cherry trees that had been half a century in attaining their productiveness. Fortunately, French arboriculturists were summoned into counsel to face the problem as to how to preserve the trees so mutilated. They were, happily, equal to the task, and proceeded to bind up the wounds like the wounds of a soldier, and thousands of army surgeons and Red Cross ambulance drivers and stretcher-bearers assisted in the work. The circle where the bark had been cut away was first covered with a grafting cement and the entire wound bandaged—often with bandages that had been prepared for human limbs. So great was the number of trees that had to be dressed in this way that the entire available supply of grafting preparation was quickly exhausted. Where the trees had been completely cut or sawn down, the protruding stumps were trimmed and the exudation of the sap was prevented by clay or cement dressings, while branches from the upper portion of the trees which showed signs of life activity were grafted on many of the severed stumps. Today, we learn, these grafts are in full leaf and blossom. The roots appear to have been entirely saved by this process, and years have been saved in restoring the cut-down orchards of France. "Tree surgery" is no new art, and for several years, particularly in America, the practice of preserving trees that have been injured by disease or accident has been successfully carried out by filling stumps with cement. The protection of several vegetable tissues with wax, tar and other substances has been long used in horticulture and arboriculture. The principles governing the "surgery" of plants are, in many respects, similar to those which appertain to human surgery.—Municipal Engineering.

GLASS FRONT BUILDING, LEWISTOWN, MONTANA
Wasmansdorff & Eastman, Architects

Says Glass Front Buildings are Not New

LEWISTOWN, MONT., July 27, 1917.

Editor The Architect and Engineer of California:

I have read with interest your article on a "Unique Glass Front Building for San Francisco," in which you state that it remained for San Francisco to present an innovation after Paris, Vienna, etc., have tried to give expression to this new form of construction.

I am enclosing a poor photograph of a building built in 1913 and completed in the spring of 1914 by us, in which we set the columns back 9 feet and cantilevered all of the floors out to the front, giving us a complete glass front without a column of any kind obstructing the show window space. The building is intended for a six-story reinforced concrete structure, three stories and a mezzanine being included in the present building.

This was some years ago and I do not know that we are the originators either, much less San Francisco in 1917. Very truly yours,

WASMANSDORFF & EASTMAN, Architects.
By O. F. WASMANSDORFF, C. E.

* * *

Revised Specifications for Mill Construction

MR. ALFRED KUHN'S splendid article in the July Architect and Engineer on "Standard Slow Combustion Building," aroused much interest and for the further guidance of those concerned in this type of construction, the following suggested requirements regarding the use of timber will be found very valuable. These suggestions are in accordance with a new standard for the mill construction type of buildings recommended by the National Fire Protection Association Committee on Uses of Wood in Building Construction in its report submitted May 8th at the annual convention of the association. The new features in the revised specifications deal mainly with the question of decay of wood and how to avoid same and with the strength of timber and how to calculate it. The report has not yet been finally approved by the association and so it should not be interpreted as its standard at the present time:

Floors.—(a) The floors shall have the least possible amount of openings, and these shall be protected in an approved manner.

(b) The floors shall be not less than 3 in. (nominal) splined or tongued and grooved, plank covered with 1-in. (nominal) flooring laid crossways or diagonally. Top flooring shall not extend closer than ½-in. to walls to allow for swelling in case the floor becomes wet. This space shall be covered by a moulding so arranged that it will not obstruct movements of the flooring.

Note.—Corbelling of brickwork under floor planks is recommended to take place of the above mentioned moulding.

(c) If laminated floors are used, at least two laminations at the wall shall be omitted until after glazing and roofing have been completed.

(d) Two thicknesses of water-proof paper or felt with sealing compound (but no asbestos) shall be laid between planking and the top flooring, and shall be turned up at least 3 in. around the posts and at the sidewalls. A counter-flashing of galvanized iron or a baseboard nailed in place with the joint between it and the floor covered with a moulding shall protect the upper ends of the water-proofing.

A fairly smooth surface shall be provided before any water-proofing is laid, and the felt or paper shall be laid breaking joints and mopped with a water-proof sealing compound. The top flooring shall be laid immediately following the final mopping.

Note.—It is recommended that the floors shall have a pitch about 1 in. in 20 ft. to scuppers provided at the floor level, number and spacing to meet the approved requirements.

(e) Where plank floors are laid flat the boards shall be two bays in length if possible, laid to break joints every four feet.

(f) Laminated floors consisting of planks 6 in. to 8 in. wide set on edge close together and spiked at about 18 in. distance with 60 penny nails shall have the joints broken in such a manner that no continuous line will occur across the floor and shall not be spiked to the supporting girders in order to avoid a movement in the girders at the walls due to expansion which may be caused by dampness. The joints between the planks of a laminated floor shall be perfectly tight.

(g) All girders or floor beams shall preferably be single stick timbers, but if double stick timbers are used, they shall be properly bolted together and contact faces shall be treated to prevent decay.

(h) Floor timbers shall not be less than 6 in. (nominal) in either dimension.

Note.—In the determination of the dimensions of floor beams special attention shall be paid not only to actual loads to be super-imposed, but also to the factor of impact or vibration of machinery.

(i) In the calculation of the strength of beams and columns, the permissible stresses established in the following table shall be used and the net cross section of timbers and not the nominal section shall be considered.

Working Unit Stresses for Structural Timbers Used in Dry Locations

Species of timber.	—Bending— Stress in extreme fiber. Lb. sq. in.	Horizontal shear stress. Lb. sq. in.	—Compression— Parallel to grain, short columns. Lb. sq. in.	Perpendicular to grain. Lb. sq. in.
Fir, Douglas—				
Dense grade	1,600	100	1,200	350
Sound grade	1,300	85	900	300
Hemlock, eastern	1,000	70	700	300
Hemlock, western	1,300	75	900	300
Oak	1,400	125	900	400
Pine, eastern white	900	80	700	250
Pine, Norway	1,100	85	800	300
Pine, southern yellow—				
Dense grade	1,600	125	1,200	350
Sound grade	1,300	85	900	300
Spruce	900	70	600	200
Tamarack	1,200	95	900	350

Note.—The safe working stresses given in this table are for timbers with defects limited according to the sections on defects in the rules of the Southern Pine Association for select structural material. "Dense" southern yellow pine and "dense" Douglas fir should also conform to the other requirements of this rule. "Sound" southern yellow pine and "sound" Douglas fir require no additional qualifications, whereas the other species should, in addition to being graded for defects, have all pieces of exceptionally low density for the species excluded.

(j) Wall plates or boxes of sufficient area and of an approved self-releasing type shall be provided at the ends of floor beams where they rest on walls.

(k) Where girders meet at the columns they should be fitted around them or butted up close to them. The ends of beams shall be held in place by steel or iron straps spiked, bolted or lag screwed on their sides unless the post caps have sides projecting upwards which can be lag screwed to the beams.

(l) Where intermediate beams are found necessary for the support of a floor they shall rest on top of the girders. Where steel or iron hangers are absolutely necessary the ends of beams shall be fitted in as well as possible and any interstices between beams framed together shall be filled in with a preservative compound.

(m) The width of floor bays depends on the layout of the floor, the loads to be carried and the arrangement of the sprinklers; it shall be not less than 6 ft. between the centers of the beams.

(n) All exposed woodwork shall be planed smooth.

(o) Pipes or tight-fitting conduits extending through floor shall be provided with metal thimbles and shall be made watertight to a height of 3 in. above floor.

(p) Cellar floor should be of cement or tar concrete laid on a suitable foundation of cinders or broken stone. The cement concrete shall be properly water or damp-proofed as the conditions may require.

Note.—Creosoted wood blocks, embedded in pitch or asphalt, may be used as finish flooring over concrete. Planking 3 inches thick embedded in tar concrete and having a top or wearing flooring over it may also be used where required.

Posts.—(a) Posts shall be proportioned in size according to the loads they will carry, but their cross-sectional dimensions shall not be less than 8 inches. All corners to be rounded or champfered. In the calculation of the strength of posts the net cross-section shall be considered.

(b) They shall be super-imposed throughout all stories on metal post caps with brackets or shall have ends connected by properly designed steel or iron caps, pintle and base plate. Wood bolsters may be used to support roof girders only.

(c) Posts shall never rest directly on floor timbers.

Quality and Kind of Timber.—(a) The structural timber used shall be free from any form of decay. Sap stain, where the timber is otherwise sound, shall not be considered a defect.

(b) For any defects in limited number or size a corresponding decrease shall be made for the allowable stresses used for the calculation of the strength of timber.

(c) Rough sawed timber shall not be more than ¼ inch and dressed timber not more than ½ inch scant the nominal size.

Note.—The following specifications for timber are given herewith for general information and are recommended as good practice.

Quality.—Girders or beams and posts, when made of southern yellow pine or Douglas fir, shall conform in quality to the specifications for "Dense Grade Pine," adopted by the American Society for Testing Materials (A. S. T. M. Standards 1916; serial designation D 10 to 15; paragraph, General Requirements; pages 515 and 516) and by the American Railway Engineering Association (Bulletin 189; September, 1916; page 78); and girders or beams and posts of oak shall conform to the requirements of oak timbers adopted by the American Railway Engineering Association (Manual of Recommended Practice, 1915, pages 641 and 642); all definitions in the specification referring to oak timbers to refer to standard definitions in this same manual, pages 631 to 640 inclusive.

Grade.—Girders or beams of southern yellow pine or Douglas fir shall show not less than 85 per cent of heartwood on each of the four sides measured across the sides anywhere in the length of the piece. In Volume 1 shall not have sound knots greater in diameter than one-fourth the width of the face on which they appear—maximum knot 1½ inches. Shall not have in Volume 2 sound knots greater in diameter than one-half—the width of the face on which they appear—maximum knot 3 inches.

The aggregate diameter of all knots within the center half of the length of any face shall not exceed the width of that face.

The diameter of a knot on the narrow or horizontal face of a beam is to be taken as its projection on a line perpendicular to the edge of the timber. On the wide or vertical face the smallest dimension of a knot is to be taken as its diameter.

Round or ring shakes shall not occupy, at either end of the material, more than one-fourth the width of green material, nor more than one-third the width of seasoned material.

Any combination of checks or shakes which would reduce the strength to a greater extent than the allowable round shakes will not be permitted. Shakes shall not show on the faces of either green or seasoned timber.

Shall not have diagonal grain with slope greater than one in twenty in Volume 1.

Posts or columns shall not have sound knots greater in diameter than one-third the least width of the column—maximum knot 4 inches. Shall show at least 85 per cent of heart on each of the four sides measured across the sides anywhere in the length of the piece.

Floor Planking.—Floor planking of southern yellow pine or Douglas fir shall conform to the grade "Merchantable" as defined by the timber rules of the Southern Pine Association, Jan. 1, 1917.

For buildings where high humidity is maintained, all floor planks should conform to the grade "Merchantable," but they should be all heart—no sap should be permitted.

Durability.—(a) The decay of wood is caused by vegetable growths called fungi, which thrive in wood in damp, poorly ventilated locations. The prevention of decay in mill buildings can be accomplished by the elimination of excessive moisture, which may be brought about by thorough ventilation or heating of all portions. Special care should be given to the design, rot proofing and selection of lumber to be used under moist conditions.

(b) Dry lumber should be used wherever possible, and should be well protected from the weather after delivery at the site. The use of green or partially dried lumber, or lumber wet by rain, snow or other causes, may create conditions favorable to rapid decay. This is particularly true of lumber in large beams or that to be used in laminated floors, under which conditions it will dry out slowly.

(c) Girders or beams which rest in masonry walls shall not be sealed in; air space of at least 1½ inches shall be provided all around the end to allow proper ventilation.

(d) Two brush coats of hot coal tar creosote or other suitable preservative applied to the ends of thoroughly dried timbers will assist materially in preventing decay if conditions are not too moist.

Note.—Do not rely upon brush treatment where timbers are to be used in damp or moist locations.

(e) Ends of girders or beams when resting on metal plates shall have the bearing surface protected by a piece of creosoted saturated felt or paper.

(f) Creosote or other preservative compound shall be applied also to the ends of columns between floors.

(g) The timbers for a mill constructed building shall be protected from moisture during construction and no paint or finish of any kind shall be applied to it before it is dry, preferably one year after the building is completed.

(h) In very exceptional cases, the antiseptic treatment of the entire structure may be desirable. This should not be done without consulting with a competent expert in the treatment of wood.

(i) Care should be taken if plaster is applied to timbers which are to be used in a dry location to have the timber thoroughly dry before its application. In cases in which such coated timbers are to be used in a moist location, it is desirable to use timber that has been thoroughly impregnated with a satisfactory wood preservative.

(j) The plaster shall be porous to permit circulation of air.

* * *

Why this is the Time to Build*

CONSTRUCTIVE selling is another name for far-sightedness. Its effects are cumulative. The thing sold, if sold right and used right, sets to work for the seller as well as for the buyer, returning a profit to both.

Constructive selling is the key to more business. The salesman who is so short-sighted as not to see beyond the transaction of the moment is facing the wrong way. Like those lovable old dike-building Dutchmen whom Washington Irving tells us about—who when landing on our shores are said to have begun building dams to hold back the Atlantic Ocean—all unconscious of the fact that ample room in two or three millions of square miles was open to them to the westward.

It is not necessary that the constructive salesman appear as, nor be thought of as sort of a crusader in a righteous cause, but he should know both his field and his product so thoroughly as to be able to see what he is selling will be used rightly, and so well that waste effort and dissipation of capital will be prevented.

As salesmen and sales managers in the construction field it is a duty to be continually paving the way to still higher ideals. An opportunity for all of us has sprung up over night. Our country is entering upon a war whose business interests will be as far reaching as the military event itself. What the outcome of the present issue will be depends upon the courage and vision of business men—what course they pursue—how they prepare. The opportunity is before us to display greater constructive effort, a higher type of constructive salesmanship, than ever before.

Modern war creates tremendous activity; it calls into use every material resource of a country, its whole machinery of production and distribution. A little over two years of world war have brought to this country a volume of business the like of which we have never before known. Our power to produce has been taxed to the limit. Constructive effort—constructive selling—has often had its mettle tested during that time. Greater opportunities, greater tests, are at hand.

Since it has been true that with our country at peace our prosperity has been unprecedented, what will it be with our country at war, with every effort being put forth to win? Billions of dollars in bonds have been voted to pay for huge purchases of supplies. The billions of dollars

* Extracts from address before the World's Salesmanship Congress, by Mr. J. P. Bock, General Manager Portland Cement Association, Chicago, Ill.

provided for in the joint loan and revenue budget of the Government are equal to the total value of our enormous export trade during the past eighteen months. The effect of putting this huge sum into circulation will be colossal. Its effect upon factories, warehouses, arms of transportation, are almost inconceivable at the moment.

Prosperity in all industries producing the necessaries of life—food, clothing, munitions, utensils and supplies—will be limited during the next twelve months only by capacity to produce and transport. Industries producing the non-essentials may languish. From them both capital and labor may be diverted.

The farmer will produce mammoth crops. He will need quantities of wagons, trucks, plows, harrows, reapers, tractors and binders. And he will have the money to pay for them. His annual cash income has lately averaged about $1,500. The Government estimates that in the next twelve months it will be $2,500. Think of the purchasing power of 6,500,000 farms.

Will American business men be ready? Will they have the factory and storage capacity, the transportation facilities, to take care of this flood-tide of business? Will they prepare constructively on a scale which will give full play to output with minimum waste? Or will they drift day by day from hand to mouth in a spirit of short-sighted fear and wait for the deluge to engulf them?

The time to build is now, before materials run short, transportation becomes still more congested and labor is drafted into military service.

Some may strain present facilities beyond normal capacity and risk a breakdown. Others may expand temporarily by means of makeshifts. This is waste. Such a mushroom plant must soon be rebuilt. It is never efficient. Facilities should be permanently enlarged and solidly built to stand the strain of huge output. Costs can be reduced through efficiency, and that is possible only in a modern, adequate, constructively planned plant.

After the war efficiency and low cost will be indispensable. Peace should find this country wonderfully equipped; its farms developed to yield maximum harvests, its industries geared to the most efficient production, its railroads and highways capable of handling promptly and cheaply the greatest caravan of merchandise the world has ever seen. Only thus can American business hold its own in the coming trade struggle between nations.

What does all this mean to the individual merchant, the manufacturer, the salesman? It means that he go steadily ahead with sound, conservative plans to build up his business; that he must not falter nor delay in providing adequate facilities to make, store and ship; that he have a faith in this country which impels him to the highest constructive effort, with an eye to the future.

During our Civil War it was those few manufacturers who had the foresight to act promptly who succeeded in establishing themselves above and beyond their competitors. In peace and in war the man who gets the business is the one who goes after it the hardest.

How should the war affect public improvements? Stimulate them to proceed without let up, along permanent lines. Bridges, terminals, warehouses and highways will be needed as never before. They are the arteries of commerce, whose congestion or breakdown would cripple the nation.

Officials in charge of public improvements can do their country and their community no better service than to push the construction of bridges, roads and buildings contemplated.

This is especially true of highways. With railroads and shipping as inadequate as they are now, a tremendous burden will be thrown upon all motor-traveled roads. They will have to bear the brunt of the short-haul traffic, transferred from railways to motor trucks. Without them, food shortage in large cities may again become a menace.

If our highways are not solidly constructed and permanently improved to stand the strain of heavy motor travel, they will become worse than useless and impose upon the public an enormous burden of repairs.

In estimating the effects of war, it is wise to look at the experience of England. An English authority recently in this country said: "If I may presume to offer the American business man a little advice, it is this: Britain's experience has shown that the war does not mean poverty, want or unemployment. It means infinitely more money in circulation than could ever be possible under ordinary conditions. The people have been spending more freely than they ever did in time of peace. There has been such an epidemic of spending money that the government has been obliged to intervene. In weeks, rather than months, you will get a great reaction such as we had, and business will enjoy a greater prosperity than has ever been known in history."

President Wilson at the opening of the war said: "It is evident to every thinking man that our industries, on the farms, in the shipyards, in the mines, in the factories, must be made more prolific and more efficient than ever."

* * *

High Prices No Reason for Construction Curtailment According to Mr. Schwab

PERHAPS the most important duty of architects and engineers at present is to study carefully the probable duration of the present era of high prices, for upon the advice of architects and engineers will largely depend the extent to which construction programs will be curtailed or expanded. Offhand it seems probable to most men that there will be a marked fall in the general level of prices as soon as the war ends. If this is to occur and if the war is to end soon, it may be wise to reduce some construction programs. But let us be quite sure of our premise that average prices will drop after the war before we adopt a policy of curtailment.

In a recent address "the great iron master," Mr. Charles M. Schwab, said:

> Let me tell you something of the experience of the Bethlehem Steel Company. Last year we entered upon a constructive program involving expenditure for the next few years of about $100,000,000. Many of our friends urged us to go slowly and wait until all costs should be reduced. But we believed that when facilities were needed they ought to be provided, and that a manufacturer should not speculate upon what he might be able to do in the future. He should do it now. That was the largest construction undertaking, I believe, ever entered upon by a single corporation.
>
> Costs are very much higher now than they were then. They promise to be very much higher in the future. But by beginning when we did we were able to greatly increase our facilities, so that they are available now, when they are so supremely needed in the interests of national defense.
>
> Bethlehem steel is today putting $20,000,000 into plants entirely for the use of the Government.

It will be noted that this executive of recognized foresight and courage had to overcome the objections of his associates a year ago when he wanted to embark on a large construction program. To his associates a hundred million dollars for new plants looked like an unwise investment to make during an "era of high prices." But to Mr. Schwab it was apparent that prices would not soon recede and would probably go higher. Moreover—and note the general significance of this—Mr. Schwab regarded it as a public duty to enlarge his plant, regardless of the personal profit that might or might not accrue.

Shall civil engineers, also charged with public duty, show more timidity than such industrial captains as Mr. Charles M. Schwab? asks Engineering and Contracting. Shall civil engineers haggle over contract prices for public works and advise curtailment of construction programs in the very hours that the country keenly needs the best and most of every kind of public plant—railways, roads, streets, sewers, waterworks, what not?

There are some engineers who are acting with less breadth of vision, less courage, and, we fear, less ordinary common sense than are to be expected of educated men. They are not even studying the industrial history of our civil war, which has thus far paralleled the history of this war in most respects.

Our civil war gave a remarkable impetus to production and coincidentally it caused a great rise in prices and wages. It was followed by eight years of high prices—until the panic of '73—and wages never receded, except in spots and temporarily.

The great war now in progress is disabling and killing millions of men, very many of whom would have normally emigrated to America. Even more effective as a deterrent to emigration will be the higher wages that the war has caused in Europe. That European wages will not fall after the war seems certain, for the workmen are earning them as a result of their greater productivity.

No future economic condition is more assured than that wages will not recede after the war, both in America and in Europe. Indeed it seems more probable that they will continue to rise indefinitely. If this is likely —and leaders like Mr. Schwab think so—where is the logic in the reasoning of civil engineers who advise restriction in construction on the ground of present high prices?

Steel, it is true, has reached a price from which it is likely to decline; but when one reflects to what a small extent the price of steel affects most civil engineering works, it is clear that even a great drop in steel prices will have only a minor effect on the average cost of public works.

Let civil engineers now, if ever, give evidence both of the faith that is in them as to our economic future and of the broad knowledge of economic conditions that they are presumed to possess.

* * *

This Month's Frontispiece

The Architect and Engineer is indebted to "The Nation's Business," published by the Chamber of Commerce of the United States, for the use of the beautiful photograph which constitutes the frontispiece in this issue. It is a striking picture of the Washington Monument seen at night through the classic colonnade of the National Treasury building in Washington, D. C. The photograph was taken especially for "The Nation's Business" by Mr. C. T. Chapman.

REINFORCED CONCRETE BARGE

Reinforced Concrete Ships—Why Not?

THE problem that confronts our country of increasing the merchant marine requires the consideration of every possible method or material of construction. Several prominent engineers have suggested reinforced concrete.

A San Francisco paper mentioned in a recent issue the interesting fact that a local firm of engineers, Messrs. Kahn & MacDonald, was designing a ship with a length of 330 feet, a beam of 44 feet and a depth of 31 feet, with a capacity of 4500 tons—to be built of reinforced concrete. This is not something new—a concrete schooner was employed for some years in the north Atlantic coasting trade, having been constructed in about 1898. The London Times mentions a small boat of reinforced concrete built by a Frenchman in 1849 and still in service after a test of 68 years.

The concrete ship is only a further development of the concrete barge, and such craft have been in successful use for years. Concrete lighters have been used for the past six years on Chesapeake bay, supplying coal and water to dredges, carrying loads of sand and gravel, etc., and the accompanying illustration of a 500-ton lighter on the ways just before launching is typical of their appearance. With such a craft there is no necessity for caulking or painting, the upkeep is small and there is no danger of decay. Barnacles will not collect on a concrete hull.

A concrete barge has been in service on the Welland Canal since 1910 and has seen very hard usage. It has a length of 80 feet, a beam of 24 feet and is 7 feet deep. It is interesting that the walls which were constructed between forms are 2½ inches thick, reinforced with steel rods, yet the barge is used for carrying loads of stone, etc., with conspicuous success.

Since 1910 reinforced concrete barges have been built for use on the various sections of the Panama Canal and their experience has enabled the engineers to develop a very efficient type of vessel. Recently concrete pontoons were constructed for service as landing stages for boats up to 65 feet in length. These pontoons have a length of 120 feet, a beam of 28 feet and are 8 feet deep. They are very thoroughly reinforced.

Vessels which are more like ships than barges have been built of reinforced concrete in Norway. A report from the American Consul General at Christiania describes a plant at Moss, Norway, where vessels of 3000 tons displacement are being constructed.

In view of such examples proving the usefulness of concrete vessels of this character, it would seem wise to consider concrete in the construction of ships which are to increase our merchant marine to the proportions demanded by the present requirements. If sea-going barges were to be constructed, or smaller craft suitable for lake traffic, this would release for other purposes many ships now in use in this capacity. The presence of the necessary materials for a concrete vessel at so many convenient locations would make it possible to provide a large tonnage, and progress in construction would be faster than with ships of steel or even wood.

* * *

Competitions

By W. JONES CUTHBERTSON, Architect

HERE are a few remarks about competitions, notwithstanding the threadbareness of the subject:

The prevalent idea of a competition is based upon an entirely fallacious premise.

This idea that a competition is to show off fine draftsmanship and simply to lay off a plan following a preconceived idea issued by the callers of the competition, is erroneous.

The raison d'etre for a real competition is that the callers want to get ideas for accomplishing the best results.

For if they simply want neat drawings worked out according to instructions, would it not be better and cheaper to employ a capable young draftsman just out of technical school?

And if they want an architect to work out a plan already settled upon, the most economical way would seem to be to select a well recommended one to put into workable technical shape the plans which they have agreed upon.

But if they want ideas then have a free and open competition, and let the ideas be given them by anybody—a farmer, a tailor or a cook—what does it matter as long as they get them?

Of course they would not agree to employ such an one to do the technical work necessary to build the structure; but they pay for his ideas and for the impartation of those ideas to the technical man employed to work them out.

Where there is more than one equally good solution of the problem advanced, a second competition becomes necessary, so as to allow the authors to work out their ideas in detail. Of course, for this they are to be paid.

All this elaborate stuff about secret competition is a sham and the making of hard and fast instructions for the conscientious, to be broken by the winner, is silliness and injustice.

As to judging of the most useful idea, I should say let all the competitors—as those who have naturally studied the problem most carefully—vote on what they think is the best idea outside of their own; this would be somewhat of a guidance to the judges who should be those who are going to use the building most of the time; who naturally know their wants best and can fully appreciate the ideas given them.

This method may possibly be abused as much as the one now in vogue; so these thoughts are only put forth as a sketch.

LIBRARY, RESIDENCE OF MR. MANSUR, LOS ANGELES
Morgan, Walls & Morgan, Architects

Planning the Library*

By JOHN HERBERT WEEKS

THE library is the room where restfulness, above all other qualities, should be the keynote of the decorative treatment. Calmness and quietness must prevail here to a marked degree. These qualities are obtainable only through a clear understanding of the more intimate relationships of line, form, and color. Although a definite formula for dealing with such a problem of art is impractical, the fundamental ideas which govern this subject may be briefly set forth.

In the library, as in the other rooms, good taste, not wealth, determines the artistic quality; and, as in the rest of the house, the location governs the kind of treatment; and elements of light, heat, or moisture have much to do with selection of materials. Besides, the individual ideas of the owner, to a certain degree, must be embodied if we are to create a suitable environment for him. In particular, the library is a room for quiet study. Seclusion and comfort are requisite qualities. Our attention should not be distracted by any object or vivid splash of color.

It is imperative to form an idea of the room in its completeness, allowing the use of only such materials as will prove appropriate together. A certain keynote may be chosen: a keynote of plainness or elaboration, of simplicity or richness. If we commence with a handsome mantel, a beautiful rug, or a rare collection of books, any one of these immediately sets a standard and governs the use of other materials. Concentration on one feature is necessary, that we may subordinate the other things and so pre-

*Extracts of an article in the House Beautiful.

serve the full value of our main object. After we have decided upon our keynote of decoration, we are confronted with the problem of devising an appropriate setting for the books, if the library is to be an ideal example.

The best method of treatment is to build the room so that the book shelves rest in recesses in the wall. Here the bindings appear even with the wall surface, lending a flat and uniform appearance to each side. The books thus seem to be an integral part of the architecture and never appear as an accessory factor in the decorative scheme. Again, the cases may be built around the room to a certain height against the walls and contain adjustable shelves, and then the cases should be as shallow as possible. Book-cases which reach nearly to the ceiling should have an arrangement of cupboards from the floor to the wainscot height. This prevents the books from being hidden behind the furniture and affords cabinet space for photographs, prints, and maps. There is another alternative in the introduction of the movable book-case which may be made very handsome with its long narrow glass doors and richly moulded cornice, or with a broken pediment or carved cresting at the top. Many tall cases rest on a solid base which contains a set of drawers; others have folding tops and compartments for writing materials.

It may be well to point out some important features in the design of the room itself which mean much in making the library successful. The location and the size of door openings should be carefully studied in order to assure seclusion. Many times we find a double door which opens into the room in front of the fireplace or directly into a space which should be a retired area. Windows ought to allow well apportioned space to alternate between them or else should be grouped together, thus giving a flood of light at a chosen spot. This arrangement would at once suggest the grouping of furniture with a large reading-table as the center of interest.

A well-proportioned room with doors and windows properly spaced affords exceptional opportunity for the arrangement of the interior furnishings, but, after all, it is this underlying principle that is responsible for the success or failure of our libraries. The background of a library counts for more even than the furnishings. It is in choosing the material and color for the walls or setting that we create, to a large extent, an atmosphere of restfulness and comfort. Here comes in the question of color, which is of vital importance. In order to preserve a feeling of repose and restraint, we are naturally attracted by the greens and the browns. Green creates a feeling of coolness and is restful to the eyes and to the nerves. Brown gives cheer and warmth, being a shade of yellow. The soft neutral shades in these colors tend to produce just the effects we desire for our restful room.

Keeping in mind the degree of richness contained in the bindings, we key the color of the woodwork, rugs and draperies to blend with them and to enhance them, and by substituting different color tones in these materials we soon find whether or not one becomes too strong for the background.

Should the collection of books be old or valuable, a choice of wood panelled walls would prove the most beautiful. Selected oak, walnut, cypress or cedar are unsurpassed for giving a rich and mellow tone to the walls. The beauty in the color of the natural wood and the varying texture of the grain is practically unlimited. With handsome leather bindings, these woods in the waxed finish appear wonderfully attractive. The division of the wall-surface into panels lends a particular interest, creating as it does a definite scale relation with the other areas, openings, and divisions.

A SAN FRANCISCO ARCHITECT'S LIBRARY

LIBRARY AND LIVING ROOM, RESIDENCE OF MR. DUNCAN McDUFFIE
John Galen Howard, Architect

These panel moldings seem to repeat the vertical lines set by the rows of books and this adds another note of harmony.

Another pleasing effect is obtained by using a series of large panels reaching nearly to the ceiling. This scheme could be used when the bookcases are built low. These panels are covered with fabric or paper of a color and texture consistent with the style of the bindings. A damask or armure in a subdued tone of light brown or tan with a little greenish tone showing through would form a good background. If any pattern is contained in the goods, it should appear only as a suggestion or as a texture. The obvious patterns always detract from the more essential things in the room. We must not overlook the value of leather or grass-cloth, as these materials give the most subtle color values and have a most interesting surface texture. They also have an advantage over fabrics, in being obtainable in a greater variety of color shades.

When the background has been tastefully treated with subdued and mellow colors, we may turn to the window draperies. Here is an opportunity to use goods with a little stronger quality of color such as the rich soft greens of the moss variety. These draperies should contain only as much pattern as will enhance the quantity of color in the books and as will blend with the texture on the walls. An effect in treatment is to let them hang in straight folds inside the wood architraves. If the windows are high, a valance or a metal cornice greatly improves the looks, since it carries the color over the top and crowns the whole feature.

On the floor, a large oriental rug of a rather quiet pattern and color, but corresponding in richness to the walls, would be ideal; but a domestic rug with a plain field and in tones of brown would form a handsome ground for the furniture and its covering, which may well have some pattern, though rather small in figure, to contrast with the plainness of the rug. The color quality, however, ought to blend quietly and bear a strong similarity to the general tone in the rugs.

The treatment of the ceiling is largely governed by the style of architecture used. With wood panelled walls we would have a beamed ceiling, stained in the same manner. If leather or grass-cloth were used, a plaster ceiling, with some low relief ornament to subdivide it would be appropriate. A slight tinge of the wall color should be given to the whiting for the plaster ceiling. There is great danger in rendering ceilings too white and thus causing a sharp contrast with the other parts, often producing a glare of light overhead.

The furniture need not necessarily belong to any one period. The real essentials are comfort, strength, and restful lines, and the general design should conform to the details of the rest of the woodwork. The mantel most often sets the standard. Since the furniture assumes a special importance in the decorative scheme, discrimination is necessary in its selection. Care should be taken not to admit patterns which are lavish or fanciful. It is evident that curves of the Louis XV period are not in harmony with the spirit of this room. The one piece of furniture which is indispensable is the library table with its handsome reading lamps. This table forms the central motive for grouping the other pieces which ought to conform to it in their general character, whether this be richness, solidity, lightness, or gracefulness. We find too often a complete departure from the main motives.

A long spacious sofa, with its back to the table or near the fireplace, is very inviting, arranged so as to receive the light from the table lamps. A few spacious easy chairs add much in expressing the feeling of rest and comfort. These upholstered pieces, though, are apt to be altogether too cumber-

some and shapeless and oftentimes are the very things that spoil an otherwise excellent room. A commodious writing desk, placed near good light, is also an indispensable piece of furniture for this room. Some other pieces that lend the right atmosphere are small stands for the dictionary, magazines, and plants. A terrestrial globe should have a place and prove a valuable aid to our geographic news.

The color for the furniture may be somewhat darker than that of the wood finish of the room and will look all the better for being so. The quality or tinge of color, however, must be like that on the wood, else the furniture will not hold the proper relationship or blend with the wood finish. An exception occurs though, when the finish is painted in tones of white, which harmonizes well with mahogany furniture.

The best method of lighting the library (other than by the reading lamps) is by wall sconces. These will give a soft, subdued light at intervals on the walls and appear very decorative in their colored silk shades. It is quite evident that this room does not need a strong light diffused from overhead, either from clustered globes or from single bowls, such as the indirect system gives.

As to the use of colored silk for shades on these lights, all colors except yellow or gold tend to destroy the effectiveness of the artificial light. Reds, greens, and blues, especially, assimilate light and also become changed themselves. Linings to silk shades must be white or of cream tints in order to reflect the full amount of light.

The accessory ornaments such as pictures, book rests, vases and plaques may be admitted but with certain discrimination. The quality in these, which bears directly on the purpose of the room, should be the guiding motive in their choice. How often, though, are we distracted by a collection of promiscuous objects, such as trophies, stuffed game and even cuckoo clocks.

The library (if it is to be one in the true sense of the word) must contain only such materials and furnishings as will appeal to the sense of rest, of comfort and of beauty. First, we create a feeling of dignity and repose by giving to the backgrounds the more neutral coloring. To this, in relief as it were, we add touches of stronger tones of color, lending by contrast a richness and interest. So, by combining certain principles of design with an expression of individual taste, we may create a library which shall have a character especially suitable to its purpose, and which will also contain the qualities of refinement and distinction.

* * *

Architecture First of All an Art

While it is unquestionable that the architect of today is more and more compelled to admit and provide for in his buildings the application of science in manifold directions, there remains the fact that architecture is, first and foremost, an art; that its primary function is the creation of the beautiful, says an English exchange. Beauty in architecture does not exclude but, on the contrary, is inseparable from full provision for the maximum of usefulness in every building. It connotes not only this provision but the expression of full fitness for its purpose in every part of every structure. It is in its highest achievement not the decoration of utilitarianism with a veneer of applied ornament, but the esthetic satisfaction of every necessity in appropriate, logical and pleasing form. Therefore, it is to be hoped that any extension of scientific training that may be introduced into the school of education of our future architects may not exclude such studies as tend to the development of the imagination and the acquisition of facility of expression.

Before a Man Builds

IS it true that the average individual who builds is more to be censured than pitied? And, if so, why? Offhand, this seems a radical and revolutionary precept: it reverses and supersedes the true and time-tried philosophy of the Save-me-che-ild-melodrama, and the charity that stirs the heart to sympathy for the erring. For, 'tis only human to err.

Perhaps that solves it, because, as may be recalled, "To err is human, to forgive divine," and when we view the well-known human race erring today in the business relationships of building as it erred last week, and last year, and on back beyond that for quite some time, it appears that a little less of forgiving syrup and a bit more corrective bitters is in order.

Mr. C. Matlack Price is largely responsible for the penning of the above and foregoing paragraphic vagaries. In his interesting volume, "The Practical Book of Architecture," is found this comment: "It is a strange and inexplicable circumstance that so many business men, punctilious to a degree in their every-day business dealings, and in the enforcement of system and routine in their offices, are flagrantly unbusinesslike in their dealings with the architect.

"Perhaps no one thing is more important for the client to remember throughout the building of his house than the fact that, after engaging an architect, he has entered upon a business relationship, and that the more businesslike this relationship is kept the better for both parties.

"The building of a house, even a small house, calls for the expenditure of too much money on the one hand and too much skilled professional work on the other to be regarded as a 'mere transaction between friends.'"

Mr. Price does not intend to imply that the relation between architect and client should be cold or suspicious. He insists that social and business relations should be kept strictly separate.

The several kinds of people who build may be divided into the abnormal, the subnormal and the normal. Least harmful, and of least importance in his relation to the average owner, is that individual, a unit of the abnormal class, who, in the beautiful spirit of braggadocio, spreads wide the news that his home or building just completed cost twice as much as it really did. It is a matter of vanity; it draws attention to him; it affords him a pleasure not to be denied.

In the same ranks, but a few steps in advance, is the man who has so much of this world's goods that if his building costs a few odd thousands more than he had thought to spend, it is a matter of little concern.

The thirty-third degree member of the subnormal division is the individual who, also for reasons of personal vanity, declares that his building cost only one-half as much as it actually cost. Now, he may have paid twice as much as he contemplated, and in the noble words of the great Chinese mandarin, he may have been "most gloriously stung," still it serves his purpose to publish the fact that he obtained his building at a bargain. His idea is to show what a shrewd trader he is, how much more clever he is than the average man who builds.

Now, he, too, has several cousins; one of whom is the canny chap who needs neither architect nor builder to lend assistance in conducting his building operation. He obtains a set of free "ideal" plans, published in a magazine, and gives up his regular business in order to supervise the construction of his own house. In that way he "saves" architect's commissions and the expense of the builder. Need it be said that he saves nothing?

Mr. Price strongly emphasizes as a *sine qua non* the absolute necessity for the fullest confidence between the building owner and his architect at the first consultation, when all details should be within the intimate knowledge and grasp of the architect in order that he may proceed with intelligence and efficiency. Should there exist in the mind of the building owner any doubt as to the general ability or special qualifications of the architect, it should be entirely removed before proceeding further. In the very nature of the case, if the project is commenced with any distrust or lack of faith, certain complications and friction will undoubtedly arise which can be settled later on only at the expense of much time and energy on the part of both parties. Lack of harmony between a building owner and his architect has caused more unfortunate friction than the matter of "extras," while a thorough understanding at the outset would have obviated all difficulty in this respect.

Extras, too, can be avoided, and most of the annoyances and worries attending the usual building operation can be eliminated when the prospective building owner comes to a realization that the art of building is a science, and that it is "strictly business."

It is not enough for him to engage architect, engineers, contractor, subcontractors, decorator and furnisher. They are engaged for every important building operation.

The fault lies not with architect, engineer or contractor, but with the building custom which fails to provide financially responsible management. Under the customary method, no one participant is in a position to issue a guarantee covering the work of all participants. The owner, lacking a guarantee, assumes the risk.

These conditions are true because the usual custom of building is practically as unbusinesslike as the owner who does not make known all of his requirements in the beginning. The fault lies as much in the system as it does with the owner, even more so. The owner is a layman who is not trained to know all the intricate details of building, and when he follows the ordinary procedure he must contend with the division of responsibility that is brought about by the different elements—architect, contractor, sub-contractors, decorators—fifty or more different professions and trades, not one of them directly responsible to him for the work as a whole.

The prospective building owner should carefully investigate the various methods of building before he definitely determines to proceed, declares Mr. C. J. Fisher in Hoggson's Magazine. No matter under what method or system of building an owner may decide to build, he should positively know what the final cost will be, and he should demand a guarantee to cover this point. He should make sure that his requirements will be first listed in detail, then all taken care of and his wishes carried out. And he should be assured and convinced that the work will be completed satisfactorily and successfully. When he does not provide these safeguards then it is that he is more to be censured than pitied.

* * *

The Garden City Plan

A GREAT deal of interest is being manifested by architects, engineers and owners in the movement to establish near Visitation, south of San Francisco, a model "Garden City" on lines similar to those followed by the distinguished city planners of England. The plan is being worked out by Mr. Charles H. Cheney, and when well matured will be illustrated and described by the designer in this magazine.

The following is an outline of the Garden City idea as interpreted in a recent letter to the Architects and Builders Journal by Mr. C. B. Purdom of the Reserve Brigade Artillery, London:

I am glad to notice in your current issue that you are among those who realize that there is something in the Garden City idea that may be found of value in dealing with the problems of housing and factories that will demand attention after the war. When it is remembered that the Garden City scheme has been before the public for not far short of twenty years, and that the actual experiment at Letchworth has been in existence for more than half that period, it is a little strange that so little is heard of the Garden City proposals in connection with the preliminary consideration of the great housing problem that will confront the country when peace comes. It may be that the Garden City has dropped a little out of sight in the last few years, having been eclipsed by the vigorous and able town-planning propaganda that the times have seen. And it is also true that, in comparison with other housing proposals the Garden City does appear to be a little idealistic and Utopian. Town planning is within the range of any town councillor, and even garden suburbs are but a detail of town development that is easily grasped and put into practice. But the idea of founding a new town is another matter altogether; and except in a tentative fashion here and there, and even in the face of the example at Letchworth, the value and practicability of the Garden City is almost entirely left out of account.

Yet the fact remains that the Garden City contains the most positive, adequate, and practicable idea for dealing in a permanent manner with the problem of housing that is to be found among thinkers or practical men of today. It aims at the organization of industrial tendencies along the lines of traditional English town life. The tendency of industry to escape from the limitations imposed upon it by the great towns to new areas, where physical and economic conditions are more friendly to its development, is the element that the Garden City seeks to utilize for the purpose of bringing prosperity to little English towns and villages that have long been stagnant or decaying. The decentralization of industry, combined with the revival of the small town, is the Garden City idea. And the revival of the small town, by bringing new, vigorous populations to the villages and little towns, so that people may live in communities of thirty, forty or fifty thousand souls, means, among other things, new life to agriculture by bringing men back to the soil. For in small towns men may have gardens and fields, attached to or near their homes, where they may grow their own food and attain to something of that partial independence of industry that was common before the industrial revolution. At Letchworth, the only existing example of a Garden City, three old villages were the starting points of the new development, and the new town has grown up from them. And though the town is not yet complete, and though it is possible to criticize it in detail, and it is even yet too early to speak of its individual success, yet it has established without any doubt whatever that the Garden City idea is workable, and that it does all that has been claimed for it. There are, in connection with Letchworth, particular problems that have arisen out of the circumstances of its foundation and growth: the simple fact that it was begun without precedent, that it itself has established precedent, is alone sufficient to account for difficulties that are likely to remain peculiar to it. But after everything has been said, it remains clear that Letchworth has a great lesson to teach us in showing what a bold and enterprising method of dealing with housing and factories and the land can accomplish. It is to be hoped that the lesson will be learned, and that the new housing that peace will see the country engaged upon will be inspired by the example of Letchworth, the true English example of town-building.

It may be pointed out that the economic basis of the Garden City is the ownership and control of the land on which it is built. Without that element the Garden City is not possible. I do not wish to elaborate on that point; but there can be no doubt that whatever the Garden City is able to accomplish in the way of the permanent solution of the problems with which it sets out to deal is possible only on condition of the economic benefit that arises from the ownership of its land. The Garden City provides a form of ownership of land in the public interest that in itself is worthy of study and emulation. The new industrial conditions that industry will need for its expansion when war is over, the new homes that men of all classes will demand after their war experiences, the scope for vigorous social enterprises that the new times will seek, may all be found in the adoption of the Garden City idea and the development of towns in accordance with it. And the bearing of the idea upon questions of social and individual health, upon child life, education, and agriculture among others, is not the least significant aspect of it.

Effects of Grading of Sands and Consistency of Mix Upon the Strength of Concrete

AN interesting paper was read by Mr. L. N. Edwards, supervising engineer of bridges for the city of Toronto, at the recent convention of the American Society for Testing Materials, held in Atlantic City, June 26 to 29. The subject of Mr. Edwards' paper was "The Effects of Grading of Sands and Consistency of Mix Upon the Strength of Plain and Reinforced Concrete." The paper presented the results of three series of tests made by the Department of Works of the city of Toronto, under the direct supervision of Mr. Edwards. These tests were undertaken with the object of securing information relating to (1) the influence of the grading of sand; (2) the effect of the consistency of mix upon the strength and physical characteristics of the concrete properties, and (3) the effect of varying the time of mix.

The author described the methods used and the results obtained, in considerable detail, and drew the following conclusions:

Common Practices Unreliable

1. The commonly practiced "visual examination" test of sand aggregate for concrete is generally unreliable, since it gives at best only a superficial knowledge of the cleanliness of a given sand. Its adaptation to the determination of grading could be of value to the observer only after long experience in the granulometric analysis of sands.

2. The generally accepted practice of proportioning a concrete mix by volume, as, for example, 1 part cement, 2 parts sand and 4 parts broken stone, is impracticable and unscientific, since it does not take into account the adaptability of the grading of a given sand to the production of a dense, strong and reliable concrete. Proportioning by volume, as commonly used, gives no guarantee of the production of a concrete having a desired strength, hardness, or other physical properties.

3. The strength, toughness, and durability of the concrete to be secured from the use of a given sand can be determined only by an actual test of that sand in a properly prepared concrete.

4. In field operations incident to spading, slicing, or otherwise compacting the concrete, the movement of the water content of the mass is intensified, whenever the sand aggregate contains insufficient fine material to hold the cement in suspension by the formation of an adequate amount of sandy paste. The free movement of the water tends to produce an improper distribution of the cement.

Amount of Water

5. The use of a quantity of water sufficient to produce a concrete, the mortar component of which is of a saturated, sticky, semi-plastic consistency, is for most practical purposes required, in order to facilitate economical and efficient placing. This quantity of water is ample for the development of the proper functions of the cement. An increase in the quantity of water used results in a proportionate decrease in the strength of the concrete. This decrease is in no sense a function of the proportions of the mix.

6. The excess water in an over-saturated concrete necessarily occupies space and thereby bulks-up the mass. By reason of its high surface tension, it forms water globules which, although somewhat affected by the weight of the concrete, are nevertheless distributed throughout the mor-

tar component and are accumulated underneath the particles of the sand and stone aggregates and the reinforcing steel. By evaporation, this excess water ultimately disappears, leaving a considerable volume of water voids and cavities which constitute an extremely important factor in the strength and reliability of the concrete.

Bond Between Concrete and Reinforcing

7. The critical failure of reinforced concrete depends upon the intensity of the bond existing between the concrete and the steel reinforcement. Concrete containing an excess of water not only develops less surface contact with the steel on account of the resulting increase in the volume of water voids and cavities; but, in addition, the excessive laitance produced by the water tends to accumulate around the reinforcement, thus contributing materially to a decrease in strength. This condition becomes further aggravated by reason of the tendency of the laitance to become less resistant with age.

8. For the various grades of concrete, the minimum ultimate strengths assumed in the modern practice of plain and reinforced-concrete design are not assured by the commonly specified requirements for sand and stone aggregates, and by the present lack of uniformity and of efficiency in field methods and operations.

9. The results obtained show no definite relation between the compressive strengths of 1:3 mortar cubes, and the compressive strengths of the concrete produced from the same sands.

In the course of the paper the author took occasion to submit the following specifications for a cement to be used for general concrete purposes. These specifications assume that provision is made for the proper proportioning of the cement content of the mix in cases where cements failing to meet the strength requirements are used. They also assume that proper provision is made for the limiting of the water content of the mix to that required to produce a saturated, sticky, semi-plastic mortar:

Sand shall be of hard, preferably silicious, material, clean, rough, free from dust, soft particles, vegetable loam or other deleterious matter. It shall consist of particles graded from coarse to fine, of sizes that will pass, when dry, a sieve having four meshes per linear inch. The grading of particles shall otherwise conform to the following:

Not more than 80 per cent shall pass a sieve having 10 meshes per linear inch, not more than 55 per cent shall pass a sieve having 20 meshes per linear inch, not more than 15 per cent shall pass a sieve having 50 meshes per linear inch, and not more than 5 per cent shall pass a sieve having 100 meshes per linear inch. Upon the 10, 20 and 50-mesh sieves an allowable variation of 5 per cent will be permitted.

Sand, when combined with a normal Portland cement and 1-inch broken granite, limestone or trap of good quality in the proportions 10 lb. of cement, 21 lb. of dry sand, and 35 lb. of dry broken stone, thoroughly mixed with 4½ lb. of water for not less than 1 minute and molded into cylinders 6 in. in diameter by 12 in. long, shall develop a compressive strength of 1,300 lb. per sq. in. when tested at the age of 7 days and a strength of 2,200 lb. per sq. in. at the age of 30 days. Strength shall be determined from an average of five cylinders tested at each age. The cylinder shall be removed from the form 24 hours after molding and shall be stored in a moist closet or in damp sand until tested.

Sand failing to develop the above strengths may, at the option of the engineer, be accepted for use, provided that the proportion of cement be increased by an amount sufficient to fulfil the strength test requirements.

Painting a Damp Plastered Wall

In writing for information to an authority on this subject a Canadian painter stated that he had a wall in an office building which was to be painted. The wall is of brick and the plaster is applied directly on the brick, while on the other side is a vault. Moisture comes right through the plaster and he says he has tried almost everything, such as painting with a sharp color, also aluminum paint and shellac varnish, but the plaster appears soft and permits moisture to percolate through. The building is close to the water and more or less subjected to dampness. One suggestion which occurred to him was to batten the wall with canvas, but he does not think a good job can be made in this way. He therefore asked the opinion of the Painters Magazine as to a remedy.

The authority in question in replying to the above said: "We have a formula for a damp-resisting paint from an experienced master painter as follows: Prepare a mixture, in a small barrel or tub, of fifty pounds air-slaked lime, ten pounds glucose, two and one-half pounds alum (powdered), fifteen pounds boiled linseed oil, five pounds oil of eucalyptus and 68 pounds warm water, adding these ingredients gradually in this rotation, stirring until all is dissolved. If the material is too stout to work freely under the brush, add more warm water. With this, coat both sides of the wall, and when one coat has become dry, apply another, and if needed, a third one. You can add to this liquid any lime-proof pigment, such as zinc white or lithopone, Venetian red or yellow ocher, four pounds of any one of these being sufficient to one gallon of the liquid mixture.

"If this does not stop the dampness, the only remedy will be to remove the plaster, coat the brickwork with paraffine varnish and then plaster over this. Canvas battening is not practical in your case, nor would layers of tinfoil arrest the dampness."

*
* *

California State Building Plans

According to the architects, Messrs. Bliss & Faville, working plans for the new California State building to be erected in the San Francisco Civic Center are practically completed and the State probably will call for bids in from thirty to sixty days. It will take at least six months for delivery of the steel. The interest which the State is receiving on the bonds should take care of the added cost of materials, according to those in charge of the preliminary work.

*
* *

Between Competitors in San Francisco

Scene: Montgomery street.

Enter, Architect, four feet four inches high. Panama hat, blonde cane.

Meets Competitor.

Turns and points across the street.

"How do you like my new building?"

Competitor strains his eyes in the direction indicated.

"What building? I cannot see any building. All I can see is 'signs' of a building."

COTTAGE FOR MISS HEAD, BERKELEY
W. H. Ratcliff, Jr., Architect

The Treatment of the Pergola

IN OUR DAY a pergola seems to be regarded as a sign of artistic enlightenment. It is new, it is fashionable, it is even becoming obvious. Like such things, it is full of danger, the danger inherent in all similar formal affairs and in the machinery of formal gardens in particular. The chief trouble with Americans in this connection is that they have gone into formal layouts backwards, not realizing that such things are produced and made reasonable by certain ordered conditions and a long devotion to the ritual of life, and that apart from such conditions the mere apparatus can make very fools of its proud possessors. A formal garden is a test. It requires a certain amount of character to live in one, and a pergola is in a sense a spiritual thermometer which will accurately try the *savoir faire* of the man who builds it. No man should build a pergola more rashly than he buys a title or subscribes to the London Spectator. All of these things are precious contributors to distinction if such already exists within; they can all take their revenge if it be lacking entirely.

However debatable the morality of a pergola, its material form is simple. The basic idea is a continuous semi-sheltered walk, useful in southern countries, like Italy, where the sun is unpleasantly hot for long periods of the year; the nature of the houses makes outdoor life of some sort inevitable. The usual terrace treatment of gardens led to long lines where sheltered passing was desirable. Architectural treatment of these lines, with piers or columns supporting a slight vine-covered structure, produced the pergola. The terrace of the Cappucini at Amalfi is a well-known example. Where the structure was less emphasized a pleached walk fulfilled the requirements, as at the Villa Gori in Siena. In Italy, however, the architectural form has always been more usual, as it apparently better satisfies the Italian instinct for form and regularity. This works itself out in purely utilitarian situations. The festoon like training of Tuscan grape vines is as beautiful as it is practical.

EXTENSION TO G. W. WATTLES' GARDEN
ELMER GREY, ARCHITECT

PORCH, PEBBLE BEACH LODGE, MONTEREY, CALIFORNIA
Lewis P. Hobart, Architect

American pergolas have developed somewhat away from their Italian prototypes. Besides semi-sheltered walks, the term is applied to arbors and partly roofed piazzas. Short pergolas, properly arbors, are set about formal gardens like outdoor scenery, and sometimes the vines are omitted altogether, so satisfactory do the posts and lintels seem to their designers. The exotic appearance of sawed beams has become a cult. People enjoy pergolas of this sort because, apart from picturesqueness, they have the obvious qualities of structure that our more elaborate buildings lack; this pleasure is that of a child in a house of blocks. But our pergolas are too often walks too short to lead anywhere—arbors without shelter, and piles of beams and columns which merely look forlorn in winter snow and wind. It was not without reason that the Gothic pergola, the cloister, had a stone vault. The logic of that age met conditions of northern climate with a solid and irrefutable answer.—Architectural Record.

HOUSE OF MR. T. M. SHERMAN, BERKELEY
W. H. Ratcliff, Jr., Architect

MISSION DOLORES, SAN FRANCISCO

[*These two missions are in an excellent state of preservation*]

MISSION SAN GABRIEL

The San Francisco State Building

(From the San Francisco Chronicle, August 8, 1917)

THE discussion about the plan for the elevation of the proposed State building in our Civic Center may be interesting, but is purely academic, as prices have so risen since the plans were accepted that construction with the money available is impossible.

Meanwhile the interest on the bonds is running on at 4 per cent. If the money is on deposit, it is presumably earning 2 per cent, which is $20,000 a year, which we suppose will accrue to the fund. By paying 4 per cent long enough, if the bond money is improved at compound interest, the time will come when it will provide for almost any building. The process is expensive, but it will win in the end. We presume that the next generation will see the State building.

There is no sense in submitting or accepting a plan with an elevation so entirely out of harmony with the other buildings in the Civic Center. There may be beauty in diversity, and there may be beauty in uniformity. It happens in this case that uniformity in certain lines had been agreed on and adopted for the facades of the buildings in the Civic Center.

The appearance of the State plan may be as attractive as those of the other buildings. Tastes differ and some might prefer the State plan. But the trouble is that it is different where uniformity is desirable, and if the building is erected it will strike every visitor as a blemish. It is so conspicuous that it cannot escape notice and unfavorable comment.

We can conceive of no motive but pig-headed obstinacy in proposing or accepting a plan certain to involve a furious controversy, and then adhering to it. Nor is it possible not to severely condemn the judgment of the architects of the awarding committee in selecting a plan so entirely out of harmony with its environment, in features to which the architects of all previous buildings have conformed.

To persist in the refusal to modify the facade can only gratify a contentious spirit and probably, if the building is erected without change, will cause the city government to erect in some prominent place on city property an ornamental signpost pointing to the State building and explaining that its lack of harmony with its environment was due to so and so, naming all of them, who were the State officials responsible in the year when the building was erected. The city could not help itself.

* * *

With reference to the controversy over the new State building at the Civic Center, Mr. Charles B. Alexander of New York, brother-in-law of Mr. William H. Crocker and a Regent of the University of the State of New York, who has had much experience in connection with the erection of public buildings, recently paid a visit to San Francisco, and is quoted as saying that San Francisco's Civic Center may be compared favorably with any civic development in the world.

"As to the precise question," he said, "involved in the discussion as to whether the new State building conforms to the general scheme of development or not, I would regard it as an intrusion on my part to express any judgment during my visit in San Francisco, but I would be very strongly influenced by the opinion of Willis Polk, whose reputation extends very far beyond the confines of the State of California.

"It was only the other day by mere accident that I heard from a man who had been intimately interested with the firm of D. H. Burnham & Co. that the great Burnham had in his lifetime expressed the opinion that Polk was one of the greatest constructive architects in the world, being possessed of a most unusual vision. It would seem, therefore, that it would meet with much approval from those interested in the decoration of cities throughout the country if, whatever is done, it should receive the backing of so eminent a specialist as Polk."

THE
Architect and Engineer
OF CALIFORNIA

Founded in 1905 by E. M. C. WHITNEY

A. I. WHITNEY - - - *Manager*
T. C. KIERULFF - - - *Legal Points*
FREDERICK W. JONES - - *Editor*

Published Monthly in the Interests of the Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast by the Architect and Engineer.

BUSINESS OFFICE AND EDITORIAL ROOMS
627-629 Foxcroft Building, San Francisco
Telephone Douglas 1828

The publishers disclaim any responsibility for statements made in the advertisements of this magazine

TERMS OF SUBSCRIPTION

(Including postage) to all parts of the United States $1.50 per annum; to Canada 50c additional; to all Foreign points $1 additional.

VOL. L. AUGUST, 1917 No. 2.

ASSOCIATE EDITORS

WM. B. GESTER. - *Inspection and Tests*
O. P. SHELLEY, C. E. } *Fireproof Construction*
F. W. FITZPATRICK. }
W. W. BREITE, C. E. - *Structural Steel*
ATHOL MCBEAN } *Brick, Tile and Terra*
W. E. DENNISON } *Cotta*
HOWARD FROST. }
H. M. LOWENTHAL - *Roofs and Roofing*
FRED'K N. WOODS, JR.. - *Rock and Gravel*
WILBUR DAVID COOK, *Landscape Architecture*
PAUL C. BUTTE - *Electrical Construction*
LOUIS G. MAUER - - *Waterproofing*
CHAS. H. CHENEY - } *City Planning and Book Reviews*
W. H. GEORGE - - *Reinforced Concrete*
T. R. BURKE - - *Sanitary Engineering*
J. W. FRICKE.. .. .. .. *School Equipment*

ARCHITECTURAL

Alfred F. Rosenheim	Edward M. Garden
Fred H. Meyer	Irving F. Morrow
August G. Headman	F. D. Hudson
Horace G. Simpson	Elmer Grey
G. Albert Lansburgh	Sumner P. Hunt
Houghton Sawyer	Ernest Coxhead
Herman Barth	Harrison Albright
Chas. S. Kaiser	John Parkinson
Chas. Peter Weeks	A. W. Smith
Octavius Morgan	William H. Weeks
J. C. Austin	Chas. W. Dickey
John J. Donovan	Jas. W. Plachek
W. H Ratcliff, Jr.	

CONTRIBUTORS

Kenneth MacDonald, Jr.	W. Garden Mitchell
Wm. L. Woollett	Nathaniel Blaisdell
Wm. Arthur Newman	Willis Polk
Wm. C. Hayes	Smith O'Brien
John Bakewell, Jr.	C. H. White
Hon. Jas. D. Phelan	B. J. S. Cahill.
Clarence R. Ward	T. Paterson Ross
John Galen Howard	Alfred Kuhn
Louis C. Mulligardt	John Reid, Jr.
Arthur Brown, Jr.	

BUILDING IN WAR TIMES

With the entrance of this country into the great world war there was a not unnatural fear in some quarters that our building activity might be greatly curtailed. Reports received from all sections of the country, however, are to the effect that the building industry has been stimulated and that we may even make new records in that line. The demand for iron and steel for shipbuilding and military purposes may cause a stringency in this branch of the market, but it has merely led to a general decision to take up masonry and concrete construction.

A very admirable article on the subject appears in the Buffalo Commercial, and this is well worth quoting in full. The writer says:

The preservation of property in this country is as much of a factor in the success of the United States in the world crisis as the mobilization of armies and the provisions being made for war supplies. The United States is called upon to finance a great part of the war costs as well as to fight shoulder to shoulder for the principles of democracy.

The closing days of the Liberty Loan bond campaign showed activity in every section of the country to raise the funds needed for the government's part in the world war, and business men throughout the land are awakening to the fact that loan subscriptions, based upon future earnings, will be broken promises if there is an unwise and sudden interruption of the business of the country. The Chicago Tribune in commenting editorially upon the question of "Building in War Times," says:

"The Illinois legislature has abandoned its plans for extensive building operations in the state departments and institutions, and with the car of faith we already hear applause the country over. Bravo! Let cities, commonwealths, and the Federal Government follow suit!"

To which impending outbursts we reply, "Be orthodox, brethren, but don't be more orthodox than his holiness the Pope." Paris has not suspended public building operations because of the war. Neither has Berlin. To curtail such operations, if by curtailment you mean putting a check on wild and wanton extravagance, is doubtless advisable. Self-confessed pork barrel expenditures must halt and there are other pork barrels besides the celebrated cask of iniquity at Washington. Pork kegs we might term them. States and cities have each their

own. Away with such! But not with the long-projected and long-needed improvements that have an incontestable value. Just because we are no longer in a position to throw money about, it does not follow that we must scrimp or perish. Neither does it follow that scrimping will prevent our perishing. It may even help us to.

As we look at it, a quietus clapped on legitimate public building enterprises would rank with the mania for private economy that is now impoverishing milliners and dressmakers and many a distressed tailor. Fine—is it not?—to see her ladyship economize by starving her modiste! Inspiring to see her husband economize by skinning his tailor!

"Business men are inclined to proceed with caution but not with timidity," said a prominent New York builder. "There has been a general question in everybody's mind whether the Liberty Loan would be a success. Had the full amount not been subscribed, it would have been an indisputable sign to building interests everywhere that America was afraid, not of war, but of keeping our heads above the industrial waters during the period of the war. With the loan more than 50 per cent over-subscribed, any business man can see that not only is America able to finance the fight, but has confidence in the immediate business future. If it didn't have this confidence, the money would have been hoarded, not placed in the very hands of the Government that contemplates a $7,000,000,000 expenditure."

This is the sentiment that seems to be pervading the entire building field.

EVERY MAN ON HIS JOB

Every man's duty is the same. Your job is your duty. My job is mine. Each of us can do his part most effectively by redoubling present endeavors at whatever his regular occupation may be.

There should be no curtailment in building and road construction. Let both public and private useful construction proceed. Production and handling of building materials and public and private construction work are fundamental industries of the country. Any tendency to suspend or postpone building projects is inconsistent with maintaining our prosperity. The country is prosperous. Building investors should not hesitate to go ahead with their plans. Railroads should spare no effort to supply the building industry with the cars needed to transport materials. Government, state, county and municipal authorities should encourage the continuance of all kinds of building. Road and street improvements in particular should go on unabated. Bad roads and streets are factors of first importance in the present high cost of foodstuffs. Never before was the improvement of highways so essential.

The lumber, brick, cement, lime, sand, gravel, stone and other building materials industries are basic. Neither Government regulations nor railroad restrictions should be imposed unnecessarily to interfere with them. If any action is taken which results in the prostration of so fundamentally important industries, there is real danger of a surplus of unemployed labor, a surplus of railroad cars and a crippling of business that will seriously embarrass the Government in financing the war.

If we are railroading, let us railroad for all we are worth. If we are farmers, put the same speed in our farming. If we are mining, let us mine as never before. Let us do the same with making shoes, making clothes, building houses, building factories, warehouses, skyscrapers, roads or whatever it may be.

Keep on building!

Tracing a Drawing Without Tracing Cloth

Tracing cloth is affected by the amount of moisture in the air, and for that reason it is occasionally desirable to transfer a drawing to ordinary paper. This may be accomplished by the use of a glass top table beneath which are suspended several strong (60 to 100-watt) incandescent electric lamps. The strong light passes through the drawing and the superimposed paper on which the tracing is to be made. Where blueprints are desired a thin white paper can thus be used instead of tracing cloth and at less expense.

Portland, Ore., Building Code

The new building code of Portland, Ore., makes a number of changes of more or less importance. The height of buildings is limited to eight stories and must not exceed 110 feet above the street line, and buildings must be set back one foot from the property line for every four stories in height.

The provisions regarding reinforced concrete buildings have been made to conform closely with the report made in July, 1916, by the joint committee of the American Society of Civil Engineers, American Society of Testing Materials, American Railway Engineers' Association, Portland Cement Association and American Concrete Institute.

In masonry construction a reduction has been made in the thickness of the walls required, in some cases a reduction from 12 to 8 inches being permitted. The tables regarding the thickness of walls have also been greatly simplified.

Buildings under the new code are divided into seven classes, as follows: 1, absolutely fireproof; 2, ordinary fireproof construction with steel frame; 3, same with reinforced concrete frame; 4, semi-fireproof; 5, mill construction; 6, other masonry construction; and 7, frame construction.

A special class has been made for "Assembly Halls," under which head are grouped theaters, motion picture houses, churches and other assembly halls.

Factory and Warehouse

Mr. Wm. H. Crim, Jr., has prepared plans and taken bids for a one-story brick box factory and warehouse for Mr. G. W. Howard. It will be erected at Second street and Dow Place, San Francisco. The estimated cost is $30,000.

American Institute of Architects

(ORGANIZED 1857)

OFFICERS FOR 1916-17

PRESIDENT.....JOHN LAWRENCE MAURAN, St. Louis
FIRST VICE-PRESIDENT.....C. GRANT LA FARGE, New York
SECOND VICE-PRESIDENT....W. R. B. WILLCOX, Seattle, Wash.
SECRETARY....W. STANLEY PARKER, Boston, Mass.
TREASURER.....D. EVERETT WAID, New York

San Francisco Chapter

PRESIDENT.....EDGAR A. MATHEWS
VICE-PRESIDENT.....SYLVAIN SCHNAITTACHER
SECRETARY AND TREASURER.....MORRIS BRUCE
TRUSTEES.....W. B. FAVILLE, G. A. WRIGHT

Southern California Chapter

PRESIDENT.....J. E. ALLISON
VICE-PRESIDENT.....J. J. BACKUS
SECRETARY.....A. R. WALKER
TREASURER.....AUGUST WACKERBARTH

Board of Directors

ROBT. D. FARQUHAR, PERCY A. EISEN, S. B. MARSTON

Portland, Ore., Chapter

PRESIDENT.....JOSEPH JACOBBERGER
VICE-PRESIDENT.....J. A. FOUILHOUX
SECRETARY.....W. C. KNIGHTON
TREASURER.....FOLGER JOHNSON
TRUSTEES.....ION LEWIS, M. H. WHITEHOUSE

Washington State Chapter

PRESIDENT.....CHARLES H. BEBB, Seattle
1ST VICE-PRES....DANIEL R. HUNTINGTON, Seattle
2D VICE-PRESIDENT.....GEORGE GOVE, Tacoma
3D VICE-PRESIDENT.....L. L. RAND, Spokane
SECRETARY.....JOSEPH S. COTE, Seattle
TREASURER.....ELLSWORTH STOREY, Seattle
COUNCIL.....JAMES STEPHEN, Seattle; JAMES H. SCHACK, Seattle; CHARLES H. ALDEN, Seattle

California State Board of Architecture

NORTHERN DISTRICT.

PRESIDENT.....EDGAR A. MATHEWS
SECRETARY-TREASURER.....SYLVAIN SCHNAITTACHER

Members

JOHN BAKEWELL, JR. J. CATHER NEWSOM

SOUTHERN DISTRICT.

PRESIDENT.....JOHN P. KREMPEL
SECRETARY-TREASURER.....FRED H. ROEHRIG
MEMBERS.....OCTAVIUS MORGAN, SUMNER P. HUNT, WM. S. HEBBARD

San Francisco Architectural Club

OFFICERS FOR 1917

PRESIDENT .....CHAS. PETER WEEKS
VICE-PRESIDENT .....A. WILLIAMS
SECRETARY .....JOHN F. BEUTTLER
TREASURER .....WILLIAM HELM

San Francisco Society of Architects

For President.....George W. Kelham
For Vice-President.....John Reid, Jr.
For Secretary-Treasurer....Warren Charles Perry
For Director (1).....Charles Peter Weeks
For Director (2).....Arthur Brown, Jr.

Engineers and Architects Association of Los Angeles

PRESIDENT.....A. H. KOFRIG, SR.
FIRST VICE-PRESIDENT.....A. S. BENT
SECOND VICE-PRESIDENT.....IRA J. FRANCIS

Directors

J. J. BACKUS, GEO. P. ROBINSON, ALBERT C. MARTIN, H. L. SMITH

Washington State Society of Architects

PRESIDENT.....A. WARREN GOULD
SECRETARY.....WM. J. JONES
TREASURER.....J. L. MCCAULEY
TRUSTEES.....HARRY H JAMES, WM. J. JONES, ALFRED BREITUNG, J. L. MCCAULEY, G. F. ROWE

San Diego Architectural Association

PRESIDENT.....CHARLES CRESSEY
VICE-PRESIDENT.....W. TEMPLETON JOHNSON
SECRETARY.....ROBT. HALLEY, JR.
TREASURER.....G. A. HAUSSEN

San Joaquin Valley Ass'n of Architects

PRESIDENT.....W. J. WRIGHT
VICE-PRESIDENT.....E. B. BROWN
SECRETARY-TREASURER.....FRANK V. MAYO

With the Architects

Building Reports and Personal Mention of Interest to the Profession

Personal

Mr. J. D. Galloway, a consulting engineer of San Francisco, has been appointed chairman of a committee on engineering and inventions for the California Council of Defense. Other engineers on the committee are Mr. Geo. A. Damon, dean of engineering, Throop College of Technology; Mr. G. W. Dickey, consulting naval architect; Mr. Frank Rieber, chief engineer Rieber laboratories; Mr. C. L. Cory, professor of electrical engineering, University of California; Mr. C. R. Weymouth, chief engineer Chas. C. Moore & Co.; Mr. Harris J. Ryan, professor electrical engineering, Stanford University; Mr. Guy Bailey, consulting engineer, and Dr. Thomas Addison, Western manager of the General Electric Company.

* * *

Mr. Mel I. Schwartz of Heiman-Schwartz, architects, with offices at 212 Stockton street, San Francisco, recently passed the first and second gunners' examination for Federal service in the Eleventh Company, Coast Artillery, National Guard.

* * *

Mr. R. A. Herold, who is one of the best known practicing architects in Sacramento, after seventeen years' steady practice without a real vacation, is planning a trip to Japan, China and India in December. Mr. Herold will be absent six months or more and will divide sightseeing with study of Oriental architecture.

* * *

Mr. Ernest Kump, architect of many fine school houses in Fresno, Kings, Kern and Tulare counties, recently enjoyed part of his vacation in San Francisco and the Bay cities.

* * *

Mr. James T. Narbett, who has long been one of the leading architects of Richmond, Cal., has been appointed captain of the engineers, Officers Reserve Corps, U. S. A.

* * *

Mr. William A. Newman motored to Lake Tahoe with his family for their annual summer outing.

Mr. A. Lacey Worswick, who has been at the head of the San Francisco Bureau of Architecture since the Consulting Board was abolished, has resigned, and is now associated with Mr. August G. Headman, with offices in the Call-Post building.

Mr. J. J. Donovan's Position Abolished

The City of Oakland, which has profited not a little by having a competent architect in the person of Mr. J. J. Donovan, in charge of school construction work, has abolished the office for political reasons, presumably, and the municipality is now without an official architectural adviser. Mr. Donovan has filled the position with credit and it is no exaggeration to say Oakland has as fine a group of school houses as may be found in any city its size in the United States. Unquestionably the time is coming when every municipality will find it necessary both from economic and artistic view points, to employ a consulting or supervising architect for not only school house betterments but public buildings of every character.

"It's An Ill Wind," Etc.

Here is a bonafide example of how realty values and property incomes have advanced in the vicinity of the new Government training station at Menlo Park, California: A one-story store building on the outskirts of the camp, which formerly rented for $5 a month, being used as a Japanese laundry, has been leased for a period of one year at the almost unbelievable rental of $150 a month.

Stockton Architects Busy

Messrs. Stone & Wright, of Stockton, are at work on plans for a $60,000 school building for the city of Tur lock. The same firm has completed plans for an electric garage and five room residence to be erected in Stockton for Mr. L. J. Kitt. Construction will be brick and tile. The estimated cost is $10,000. Messrs. Stone & Wright have also completed plans for a $5,000 private garage.

Homes for New City Being Planned

Mr. Chas. H. Cheney, Crocker building, San Francisco, is at work on plans for the first unit of homes to be built in San Francisco's "Garden City" in Visitacion Valley. It is proposed to build a restricted home district for about 10,000 persons. Each house is to accommodate from four to eight families, so arranged that each family will have quarters equal to a private home. The houses will cost from $8,000 to $24,000 each. The Conservative Building & Investment Company, composed of many prominent and wealthy San Francisco business men, is promoting the enterprise.

$15,000 Commercial Garage

Mr. Perseo Righetti, formerly of Righetti & Headman, has taken bids for the erection of a $15,000 class C commercial garage at California and Locust streets, San Francisco. Structure will occupy a ground area of 137 x 107 feet. Mr. Righetti has awarded contracts for remodeling the Marx building, recently damaged by fire at Ukiah. It is a two-story store and office structure, and the improvements will cost about $10,000.

Elks Club Building Changes

Mr. A. A. Cantin, who designed the Elks Club building in San Francisco, has prepared plans for a number of extensive alterations to that structure. The plans have been sent out for figures and the work probably will cost $10,000 or more.

More Government Work

Plans are completed for five one-story frame contagious wards, each building covering an area of 150 x 35 feet, at Angel Island.

Plans are under way at the quartermaster's office at Ft. Mason for a large concrete warehouse to be erected at the army transport docks, San Francisco, at a cost of $75,000. The structure is to be two stories and basement, and will cover a ground area of 200 x 400 feet.

New Los Angeles City Engineer

Mr. A. C. Hansen has been appointed City Engineer of Los Angeles to succeed Mr. Homer Hamlin, who was removed by the Board of Public Works "for the good of the service." The retirement of Mr. Hamlin is the result of friction between the engineer and the Board of Public Works extending over a long period. Mr. Hamlin held the office about ten years.

Mr. Hansen, the new City Engineer, was appointed chief deputy under Mr. Hamlin in 1913. He was graduated from the University of California in 1902.

Another Pottery Works Destroyed

The San Francisco clay and pottery industry has received two severe blows within a short space of time. First came the destruction of the Steiger Terra Cotta and Pottery Works at South San Francisco, to be followed on July 28th by the burning of N. Clark & Sons' large plant in Alameda. Both fires were of a very destructive nature and it has left the future source of supply largely up to the Gladding, McBean Company for terra cotta and sewer pipe; the Los Angeles Pressed Brick Company, which latter concern operates an enlarged brick plant at Richmond, for pressed brick, and the Livermore Fire Brick Works for pressed, matt glazed and enameled brick.

Apartment House and Residence

Messrs. Heinzman & Schwartz, 212 Stockton street, San Francisco, state that the proposed seven-story and basement apartment house at Sacramento and Gough streets, San Francisco, for M. Stulsaft & Co., is to go ahead just as soon as contracts can be let. Construction is to be concrete and the building will contain 12 apartments of six rooms each, with garage, ball room, etc.

The same architects have completed drawings and taken bids for an $8,000 residence to be built at Wellesly Park, Redwood City, for Mr. John R. Cook.

Alterations to Oakland Orpheum

Mr. G. A. Lansburgh, Gunst building, San Francisco, has prepared plans for alterations to the Orpheum Theatre at Oakland. The work will consist of enlarging and remodeling the rest rooms, toilets, new plumbing, painting, plastering, electrical work, ventilating, etc. The improvements are being made by Messrs. Barrett and Hilp, Sharon building, San Francisco.

Changes to Odd Fellows Building

Mr. Earl Bertz has made plans for extensive alterations to the ground floor of the Odd Fellows building at Market and Seventh streets, San Francisco. The large store formerly occupied by Roman's Clothing Establishment is being divided into six small stores with new plate glass fronts, marble and tile work, electric fixtures, etc.

Colonial Country House

Messrs. Ward and Blohme, Alaska Commercial building, San Francisco, have prepared plans for a $12,000 country home to be built at Hillsborough, San Mateo county, for Mr. Geo. A. Newhall. The design is Colonial.

New State Housing Bureau

A new department, known as the "State Housing Bureau," under the Commission of Immigration and Housing of California, with headquarters in the Underwood building, 525 Market street, San Francisco, has commenced active operations.

Mr. Mark C. Cohn, who has been identified with the Los Angeles Building Department as chief deputy for the past twelve years and who served as a member and secretary of the Building Ordinance Commission for the past three years, has been appointed director of the new bureau.

The duties of the new department, among other functions, briefly, will be to obtain, through local officials, in all parts of the State, including cities and towns, a diligent and uniform enforcement of the State housing laws; act as a clearing house and assist local officials in making uniform interpretations in the enforcement of the State laws, etc.

Los Angeles Building Operations

The Los Angeles City Building Department during the fiscal year ended June 30, 1917, issued 7,252 permits for the erection, construction, alteration and moving of buildings. The estimated cost of the buildings represented by these permits totals $18,967,484. This is a net increase in the cost of the buildings represented by the permits over the preceding (1915-16) fiscal year of 41.7 per cent. The total represented by the permits issued during the 1915-1916 fiscal year was $13,378,894.

$40,000 Private Garage

Messrs. Bakewell & Brown of San Francisco have completed plans and a contract has been let to Mr. George Wagner on percentage for a Class C private garage and chauffeur's apartments for Mr. W. B. Bourne, president of the Spring Valley Water Company at Mr. Bourne's country place in San Mateo county. The improvements will cost $40,000 or more.

Eureka Bank Building

Mr. G. A. Applegarth of San Francisco, and Mr. Fay R. Spangler, associate, of Eureka, have completed plans for a four-story reinforced concrete bank and office building to be erected at Eureka for the Home Savings bank of that city.

Warehouse Addition Planned

It is stated that Peet Brothers, soap manufacturers, are planning another extension to their West Berkeley plant. More warehouse facilities are needed.

Oroville School

Plans have been completed by N. W. Sexton & Company, Merchants National Bank building, San Francisco, for a $60,000 school house at Oroville. Construction will be of hollow tile, faced with cement, terra cotta tile roof and an auditorium to seat 500 pupils, and twenty class rooms.

Mr. Lewis P. Hobart Busy

Besides preparing working drawings for the Newhall building and a seven-story building for the Y. W. C. A., Mr. Lewis P. Hobart of San Francisco is preparing drawings for a pretentious country residence to be built at Pebble Beach, Monterey, for Dr. Rothchild.

Cold Storage Plant

Plans have been prepared by Mr. W. H. Toepke, Maskey building, San Francisco, for a $60,000 cold storage plant to be built at Stockton for the Union Ice Company. Building will occupy ground area 200x100 feet and will be one story high.

Vallejo Stores and Apartments

Mr. O. R. Thayer, of Vallejo, who also has a branch office at 110 Sutter street, San Francisco, is preparing plans for a three-story concrete store and apartment building to be erected on Georgia street, Vallejo, for Morris Liberman. The building will cost approximately $18,000.

Wells Fargo to Build Garage

Plans are being prepared by Mr. W. H. Humphrey, Wells Fargo building, San Francisco, for a one-story garage, 57x100 feet, to be erected on 14th street, near Center, Oakland, for the Wells Fargo Express Company.

Factory Building

Miss Grace Jewett of San Francisco has prepared plans for a three-story, Class C factory building, 100 x 100 feet, to be built on Fourth street, near Broadway, Oakland. The estimated cost is $30,000.

Architect to Build Flats

Mr. Chester H. Miller has taken figures for a two-story frame flat building to be erected for himself in Berkeley. About $12,000 will be expended on the improvements.

Personal

Messrs. Thomas Morrin and Albert V. Coddington, consulting mechanical engineers of San Francisco, have entered into a partnership under the firm name of Morrin & Coddington.

Making Use of Exposition Buildings

While the Panama-Pacific Exposition is only a memory, many of the buildings which were erected for exposition purposes, aside from the California building, promise to find permanent use.

The California building, intended as a normal school, will become the temporary home of the naval reserve, if the legal formalities can be complied with.

The Oregon building has been taken by the army and turned into a club building with a restaurant and some sleeping accommodations.

The Ohio building, designed after the State capitol building at Columbus, is being used by the aviators at Redwood City. The removal of this building by water from the grounds to its present location on barges, was one of the recent notable feats of engineering skill.

The Wisconsin building, modeled after the Mt. Vernon home of George Washington, is on the beach, soon to be moved, it is said, to Marin county, there to serve as the home of the Santa Venetia club.

Arrangements are under way for the removal of the pagoda-like Siam building to Washington, D. C. The Hawaiian building remains, as of course does the great Art Palace, and both are now under the same management.

Contract for Berkeley Bank Addition

Mr. John G. Howard, 604 Mission street, San Francisco, has let a contract on percentage to Harry McCullough for the construction of a two-story concrete and brick addition to the First National Bank building, Berkeley. Work will cost approximately $25,000.

Oakland Residence

Mr. Frederick Soderberg, First National Bank Building, Oakland, has taken bids for the construction of a two-story and basement frame and plaster residence and garage on Lake Shore avenue, Oakland, for Mrs. J. J. Shoo, 1507 Harrison street.

Country House for Mayor Rolph

Mr. John Reid, Jr., is preparing plans for a $25,000 country house for Mayor James Rolph, Jr., of San Francisco. The house will be built at Mr. Rolph's suburban estate near Crystal Lake, San Mateo county.

$20,000 Los Altos Residence

Plans have been completed and bids taken for the construction of a $20,000 country house at Los Altos for Mr. Edward J. McCutchen, San Francisco attorney. The house is to replace the McCutchen home which was recently destroyed by fire. Mr. John H. Thomas is the architect.

High Prices

Architects and builders have generally come to the realization that there is to be no advantage gained by further waiting for a recession in the prices of structural materials. While the feeling is strong in some quarters that the top of the market has been about reached and that prices cannot possibly be advanced much further, there is also a conviction that there will be no general recession in prices for the next four or five years, if then. The consensus of opinion in the building trades is now that high prices are with us for a long stay and no matter what occurs to reduce them temporarily, they can never return to the low levels of former years.

Whether the present war continues for one or two years or is ended in a few months, there is every likelihood that the high prices of building materials will be maintained at approximately the present levels. Foreign buying will continue to be a strong feature of the market for many years to come, and it is generally conceded that a large proportion of the immense quantities of structural materials and building supplies necessary for the reconstruction of destroyed cities and towns will have to be the product of American manufacturers.

Berkeley Architect Moves

Mr. James W. Plachek, who has occupied offices in the Acheson building, Berkeley, since he began the practice of architecture in the college town, is now situated in new offices on the second floor of the building recently completed by him for former Mayor Heywood at 2014 Shattuck avenue, Berkeley.

School Bonds Failed to Carry

The $40,000 bond election for a new Union High School building at Cupertino, near San Jose, resulted in the defeat of the bonds by a considerable majority. Plans for the building were to have been drawn by Messrs. Allison & Allison of Los Angeles.

State Highway Bridge

Advertisements for bids for a large State highway bridge over Cottonwood Creek, near Redding, will appear shortly, according to Austin B. Fletcher, highway engineer. The bridge as planned consists of nine reinforced concrete arch spans of 60 feet each.

Fraternal Hall

Mr. George E. McCrea, First National Bank building, Oakland, has completed plans for a two-story and basement frame and stucco fraternal hall for the Fraternal Hall Association of South San Francisco. Estimated cost, $20,000.

Award to Lowest Bidder

The wide discrepancy in bids for the construction of buildings has always been a matter of wonder or indignation to the uninitiated—of wonder, if he attributes to mankind motives of common honesty; of indignation, if he regards most men as rascals. Whatever his viewpoint, the discrepancy exists and remains a mystery.

It is a fruitful theme, one that is pressing upon the constructive intelligence of all factors actively identified with construction work. And distinctive progress is being made towards a solution. Among others, the Master Builders Association of Boston has been vigorously discussing this question in its monthly letters of recent date. In its latest number Secretary William H. Sayward says:

"Owners and observers have been puzzled in estimates submitted by contractors and have remarked that there must be something wrong when figures submitted are so wide apart. The 'something wrong' is in the lowest-bidder principle. The contractor who bids extraordinarily low, in nine cases out of ten, does so because he is very anxious to get the work to enable him to carry his force of men along to meet the demands of some other undertaking, or he may have the less legitimate purpose of using payments that will be coming to him on the new work, to make up, bridge over, losses or retention of payments on other work he is just completing."

The continuance of unrestricted competition is not given approval by Mr. Sayward. The remedy suggested is to limit the competition to bidders of selective type. Says Mr. Sayward: "For work of either small or great proportions, the safe and sane method of procedure is to open bidding only to concerns that are qualified in every way to perform the work to be undertaken."

Form Clay Products Bureau

The Clay Products Bureau has been organized to encourage the use of vitrified sewer piping and to increase the friendly business relations of its members. The officers are:

Chairman, George Chambers of Gladding, McBean & Company, San Francisco.

Vice-Chairman, H. C. Maddox, Sacramento.

Secretary, Frank Costello, San Francisco.

Treasurer, George D. Clark, Oakland.

Executive Committee: H. J. Crowe, Seattle; V. E. Piolett, Spokane; E. M. Durrant, Los Angeles; Frank Costello, San Francisco.

San Francisco Hotel Additions

Messrs. Cunningham & Politeo of San Francisco have been commissioned to prepare plans for an eight-story 100-room addition to the Hotel Stewart on Geary street, near Powell, San Francisco.

Messrs. Reid Bros. are preparing plans for extensive alterations to the Hotel Fairmont. The improvements will probably cost $40,000 or $50,000. A similar amount is to be expended by the St. Francis Hotel management in fitting up a new dining hall and making other important changes. It is stated that Mr. Jacklin has leased the entire upper story of one wing of the St. Francis in addition to the floor which he already occupies and will have the two floors rearranged. One feature will be a beautiful private dining room, with ceiling the height of the two floors.

Messrs. Smith & Stewart are completing plans for a seven-story addition to the Hotel Ramona on Ellis street. One hundred rooms will be added. The work will entail an expense in excess of $100,000.

Mission Home for San Francisco Business Man

Messrs. Willis Polk & Company have completed plans for a Mission type house to be built at Atherton, San Mateo county, for Mr. Elixis Ehrman at a cost of $40,000 or more. The house has been designed on true Mission lines similar to those found in some of the historic buildings at Monterey. Besides the residence, there will be a large garage, swimming pool, terraces, and landscape gardening.

Palo Alto Residence

Mr. Chas. S. Kaiser, Mechanics Institute building, San Francisco, is preparing plans for a one-story frame and plaster bungalow to be built in Palo Alto for Mr. F. C. Swearinger of that city. Mr. Kaiser is also preparing preliminary plans for two other houses to be built down the Peninsula.

Oakland Garage

Mr. F. D. Voorhees, Central Bank building, Oakland, has made plans for a one-story and basement Class C garage and store building for Mr. Mandell Goldwater. Structure will occupy the northwest corner of Twenty-third street and Broadway, Oakland.

Addition to Factory

Plans have been completed by Mr. Herman Barth, 12 Geary street, for a two-story brick addition to the factory of A. Lietz Co. on Commercial street, San Francisco. I. W. Coburn has been awarded the contract.

The Contractor

HIS TRIALS, TRIBULATIONS AND TRIUMPHS

What, Why and When Is a Sub-Contract?

By E. T. THURSTON, C. E.

GENERAL conditions of building specifications almost universally contain a clause providing that the contractor shall not sub-let any part of his work without the written approval of the architect. * * *

The writer wishes to confess first-off that he has been prone to consider this clause as a dead letter, inasmuch as against him it has never been successfully enforced. It is evident, however, that many architects take it seriously, and every little while one arises to assert his duly specified rights and make an example of a presumptuous contractor.

Naturally consideration of this question should not ignore that other provision which forms an essential part of every contract and is generally an explicit part of every specification, to the effect that the original contractor shall be exclusively responsible for all material, labor and workmanship covered by his contract whether furnished and performed by him or by someone else.

In common parlance the term "subletting" is the converse of "sub-contracting" and refers exclusively to negotiations between a person holding a direct or original contract with an owner and a third party. The result of such negotiations can in no wise affect the legal relations of owner and original contractor, such relations presumably being accurately defined by the terms of the contract, which normally has for its object the accomplishment of certain specified work of value for the owner and not to ascertain how skillfully the contractor may manage to extricate himself from a mass of general and irresponsible restrictions written into the specifications by the cautious architect, and by means of which the latter may seek to impose his judgment over that of the contractor with respect to the management of the work for which the latter has assumed sole responsibility. Such being the case, what honest purpose can the provision have? Its real purpose in some specifications has been open to suspicion; but on what basis has it found its way into the new standard documents of the American Institute of Architects, whose officials are above suspicion?

The anticipated answer is that the owner must be protected against unskillful workmanship. Yet the architect, in approving a proposed sub-contractor, does not necessarily accord advance approval to his work, the original contractor still being held responsible in undiminished degree. Would such a sub-contractor in effect be answerable to the contractor or might he not deliberately ignore the contractor and his interests, assured by the architect of immunity from any financial penalty? May not the contractor justly question whether legally he could, on the one hand, be forced under such a clause in the specifications to employ on the work only such persons as may be approved by the architect, regardless of the workmanship they may actually turn out; or, on the other hand, be held to answer for the behavior of persons over whom he is

Wybro

Reg. U. S. Pat. Office

Veneered Panels that ARE good—order today from

White Brothers 5th and Brannan Sts. San Francisco

Why we Guarantee Wybro Panels

The reason we so unhesitatingly guarantee the WYBRO PANELS is because we have yet to see their equal in point of **quality** and smoothness.

We have yet to see a better made panel at **any price**—a panel that will look as well and last as long as the WYBRO.

That is why we give the broadest kind of a guarantee on WYBRO PANELS.

prevented by the terms of the specifications from exercising effective control?

It is the writer's opinion that both owner and contractor are allowing themselves to be bunkoed through this specification. There is neither law, custom nor trade necessity to excuse the letting of contracts to irresponsible or incompetent persons, nor is it evidence of business acumen to act on the assumption that an architect who cannot in the practice of his profession prepare plans and specifications intelligible to an experienced contractor, and by means of which the contractor may be held rigidly to the performance of certain work in a given way, is nevertheless qualified to direct and intervene without responsibility in the management and execution of construction work, which is the contractor's immediate specialty.

If it be desirable to exercise independent control over any portion of a structure, it may always be segregated and let by direct contract with the owner, and the general contractor required by the terms of his contract to accommodate his work to such arrangement. The reason why such is not the usual practice doubtless lies in the abhorrence of architects for ultimate material responsibility and the supineness of contractors. It is time such practices were stopped and the technical press could perform a meritorious public service by repeatedly rubbing it in on lay and professional minds alike by precept and example—that authority must ever go hand in hand with responsibility in every walk of life if we are to enjoy peace and prosperity.

Apart from the main question just discussed, and taking conditions as they are, it is meet from a practical standpoint to recur to our opening question, and demand a clear definition of the term "sub-let" or "sub-contract." Although it may be customary to speak of buying rather than sub-letting lumber, mill work, hardware and steel, while we commonly speak of sub-letting plumbing, heating, roofing, masonry and plastering, an agreement to purchase in either case constitutes a contract. Moreover, what essential difference can it make to an owner whether the contractor pay the foreman in charge of a particular portion of the work by the day or week or a lump sum for the job?

The building industry is so highly specialized that many branches are most efficiently undertaken through the medium of specialty contractors. In some cases such procedure is rendered imperative by reason of the impracticability otherwise of obtaining the necessary materials, and, in certain cases, even the labor. The fact that the general contractor estimates the value of a given piece of work and undertakes for an owner to do the work for an agreed price does not necessarily imply that he will do the work himself. But having thus obligated himself, is he to be limited by the whim of a third party as to the manner of his procedure?

Intimate knowledge of the economics of building construction is in general with the contractor rather than the architect, and every contractor could tell of many an owner that has been subjected to unnecessary expense because of an exclusive or ill-considered specification drawn, let us say, unwittingly, in the interest of a patented article of no special intrinsic merit. An instance is in mind of a felt and composition roof at $15 per square placed on a reinforced concrete slab to underlie a layer of terra cotta Spanish tile. The specifications were prepared through the friendly, gratuitous offices of a commercial specialist and competition was excluded. Of course the contractor has no cause for complaint under a definite specification as was the one in point, but if, under the wording of the general conditions, he may be limited in his procedure at the will of the architect, he has a very evident cause for complaint, and it is strongly to be questioned whether the position assumed by the architect is legally tenable.

Finally, let it be answered! What, why and when is a sub-contract?

Common Sense vs. Hysteria in War-Time Economy

By B. G. MARSHALL

IT OUGHT to be apparent to the most careless and light-minded people that the present is the time to put in practice all wise measures of economy. The expenditures in the great war are on a scale far beyond the imagination. The debts created by all previous wars are trifling in comparison. America is undoubtedly the strongest of all the belligerents in a financial way, and her vast natural resources give the best hope for an early recovery from the effects of these huge expenditures. Nevertheless, the wisdom of limiting luxury as closely as possible should be instantly apparent. The army and navy and the dependents of those who go to the front should receive practically the whole of the wealth which in recent years has been employed in promoting indulgence and display.

Some of the best financial thinkers in the country, however, have been quick to recognize the fact that with some persons there is a likelihood of the pendulum swinging too far in the other direction, resulting in the curtailment of expenditures for perfectly normal and wholesome purposes and the hoarding of money to the grave detriment of industry.

An outstanding instance of this sort of hysterical economy is afforded by a proposal made in at least one State to entirely suspend construction work of a public nature until after the war. If this foolish proposal should be generally acted upon, it would mean that badly needed schools, court houses, hospitals and other public buildings must await the outcome of the great military struggle, and that the people must deprive themselves of needed facilities for education and the public business.

If the proposal were made to apply to the construction and maintenance of highways, its results would be even more immediately damaging. The transportation of food and other commodities over our streets and roads is an absolutely necessary portion of our activities, not only with reference to the civil population, but also with regard to the vast totals of military supplies and munitions. It is just as necessary to provide good roads to transport wheat, corn, cotton and steel to market as it is to produce these commodities in the first place.

Let us hope that war-time economy will be effected by a reduction in the manufacture and sale of pleasure boats and cars, expensive clothing, jewelry, costly foods and wines rather than in those products which are essential to the normal life of the Nation and to its financial and military strength.

Further Details of U. S. Army Camp Contracts

WITH reference to the contract arrangements made by the United States Government with contractors on the new army cantonments, the following are some of the interesting details:

The Government's interests are safeguarded by a clause permitting its representatives to terminate the contract at will. As there are no restrictions in the agreement which are considered likely to hamper the contractor, it is not expected that there will be any serious difference of opinion between the Government and any of the firms chosen for the work.

The most interesting features of the form of contract are those governing the financial relations between the Government and the contractor. The latter is to be paid his expenses and a percentage of their total amount, out of which he must meet his overhead costs. The contractor's profit will come in the difference between this percentage and overhead expenses. The maximum amount on any contract is fixed at $250,000.

The Government promises to reimburse the contractor on the following items for which he makes an outlay:

1. All labor, materials, and machinery necessary for the work. No departure from the standard rate of wages in the locality may be made without the consent of the Government's representatives.

2. All sub-contracts.

3. Rental for construction equipment hired or owned by the contractor at rates fixed in detail on the contract. The rates may be judged from the daily rental of $5 permitted for the use of an automobile.

4. Transporting, setting up and dismantling such equipment.

5. Transportation of field forces engaged in the work.

6. Salaries of resident engineers, superintendents, timekeepers, foremen or other men in the contractor's field office.

7. Buildings, field office supplies, equipment, commissary department, and hospital expenses required during construction.

8. Insurance and bonding expenses, uninsured losses and expenses incidental to the work and approved by the Government's representatives.

9. Fees, deposits, royalties and similar necessary expenses.

10. Transportation, traveling and hotel expenses of contractor's employees actually incurred in the work.

The Government has endeavored to give the maximum amount of flexibility to the contract in order that all low rates accessible to the Government in the matter of materials and other items of expenditures may be utilized. For instance, the Government may pay any or all freight charges incurred in obtaining material and machinery; which would tend to reduce the amount on which it must pay a percentage to the contractor.

The contractor is to furnish a bond of $250,000. His profit and overhead expenses must come from an additional payment made by the Government amounting to 6 per cent of his expenses as enumerated above in cases where the work costs over $3,500,000 and running up to 10 per cent if the total is under $100,000. The total amount of this percentage payment will in no case be allowed to run over $250,000, no matter how high the total cost of the work may be.

The value of any construction equip-

WALL PAPER ✤ Uhl Bros.
PHONE KEARNY 255 38 O'Farrell Street, San Francisco

LIGHT — POWER — TELEPHONE INSTALLATIONS

STANDARD ELECTRICAL CONSTRUCTION CO.

MANUFACTURERS OF

SWITCHBOARDS AND PANEL BOARDS

Contractors and Engineers

60 NATOMA STREET,
SAN FRANCISCO, CAL.

Phone Sutter 894

WE USE EXCLUSIVELY "TRUMBULL"

PLAINVILLE SWITCHES

HIGH GRADE
ELECTRICAL CONSTRUCTION WORK
FOR BUILDINGS

BUTTE ENGINEERING AND ELECTRIC CO., 683-87 Howard Street,
SAN FRANCISCO, CAL.

PACIFIC FIRE EXTINGUISHER CO.
ENGINEERS AND CONTRACTORS

Heating and Ventilating, Electrical Installations, Fire Extinguishing Apparatus

THE GRINNELL AUTOMATIC SPRINKLER

Main Office: 507 MONTGOMERY STREET, SAN FRANCISCO, CAL.

Branch Offices:
217-218 Colman Building - - - - - - - - - Seattle, Wash.
504-505 McKay Building - - - - - - - - - Portland, Ore.
826 Paulsen Building - - - - - - - - - - Spokane, Wash.
563 I. W. Hellman Building - - - - - - - Los Angeles, Cal.

Ask the Architect-He Knows

where you can get good and suitable lighting fixtures for your new building. He is interested in having the lighting brighten (not deaden) the effects he has sought to accomplish in his architectural design. He will, doubtless, advise you to go to ROBERTS MFG. COMPANY, 663 Mission Street, San Francisco, where you will find the largest stock to select from, all at equitable prices.

FORD MOTOR CO.
THOMAS EDISON, Inc.
UNITED SHOE MACHINERY CO.
ARMOUR & CO.
SWIFT & CO.

Salesmen don't sell concerns of this kind.

Their decision in favor of "Bay State Brick and Cement Coating" was rendered by high-salaried engineers, paid to know.

One of the above firms has used more than 200 barrels, the balance 100 barrels or more each.

JAMES HAMBLY & SONS are local distributors for Wadsworth, Howland & Co., Boston, who have manufactured "Bay State" for more than sixteen years.

Wadsworth, Howland & Co., Inc.
BOSTON, MASS.

DISTRIBUTING AGENTS:

JAMES HAMBLY & SONS, 268 Market Street, San Francisco, and 447-449 East Third Street, Los Angeles
J. B. Winstanley & Co., - - - Portland, Ore.
F. T. Crowe & Co., - - - - - - Seattle, Wash.
Jones-Moore Paint House, - - San Diego, Cal.

ment furnished by the Government is not included as a part of the cost of the work when determining the contractor's percentage, nor any uninsured fire or liability losses which the Government may pay to him under clause 8, nor any payments by the Government for freight, nor any of his overhead expenses. The contract fixes his compensation on the cost of work done by sub-contract at 5 per cent and on the reconstruction of damaged work not over 7 per cent.

Cost of Engineering and Other Items on California Roads

In an expenditure of about $16,500,000 for state roads in California, engineering and allied overhead costs have been 12.75 per cent of the gross construction costs of those roads that have been completed. This relates to 1490 miles, of which 966 miles are concrete ("oil-surfaced"), 129 miles are oiled macadam, and 395 miles are graded but not paved.

A total of 2350 miles have been surveyed, including the 1490 miles built, and the surveying has cost $317 per mile.

The 1490 miles of completed roads (395 miles not paved) have cost about $11,000 per mile, so that the surveying alone has averaged nearly 3 per cent of the construction cost. This leaves about 9.75 per cent as the cost of engineering inspection, laboratory testing, equipment depreciation, legal expense and expense incident to purchasing cement and asphaltic oil for the roads. The legal expense (less than $30,000) and the laboratory testing (less than $28,000) have been very small. It would be interesting to know the purchasing expense, distinct from engineering and inspection.

Nearly all the work has been done by contract, the state furnishing the cement and asphaltic oil.

The state has purchased equipment (autos, camps, furniture, etc.) costing about $165,000, having a present salvage value of about $107,000. The depreciation of $58,000 is included in the 12.75 per cent given above. Hence, if we deduct surveying, legal expense, laboratory testing and equipment depreciation, we have left about 9 per cent as the cost of engineering, inspection and purchasing.

Average unit costs of this construction work (including materials) during the past six years have been about as follows: Excavation and compacting subgrade, 41 cents per cubic yard; concrete pavement (including cement), 4 inches thick, 74 cents per square yard; asphalt wearing surface (1½ inches thick), 45 cents per square yard; oil top (¾ inch thick), 5.4 cents per square yard.

These are all low costs, so low in fact that very few contractors made any profit. An average excavation price of 41 cents per cubic yard in a country

To Be "Low Bidder" Not Always Our Aim.

Our most particular attention is given to prompt and skillful handling of all electrical work of any nature with "QUALITY AND SERVICE GUARANTEED."

Our nation-wide organization and large experience in this field assures you always of fair estimates and absolute satisfaction.

F. E. NEWBERY ELECTRIC CO.

163 Sutter St. (413 Lick Bldg.) San Francisco, Phone Sutter 521

ASBESTOS PROTECTED METAL FOR ROOFING AND SIDING

For permanent industrial buildings of all classes.
Economical — Low maintenance.
Permanent without paint under the most severe conditions of service.

ASBESTOS PROTECTED METAL CO. Ask for Bulletin.

First National Bank Bldg., PITTSBURGH San Francisco Office, Hobart Bldg.

C. JORGENSEN & CO.

BUILDING MATERIALS

Phone Kearny 2386 20 Crossley Building, SAN FRANCISCO

LUXFER
SIDEWALK LIGHTS
TRANSOM PRISMS

TOCH BROS.
"LIQUID KONKERIT"
"TOXEMENT"

JAS. P. DWAN, Hearst Bldg., San Francisco Phone Douglas 3199

DESIGNERS OF FIXTURES

GOOLD & JOHNS

ELECTRICAL CONTRACTORS AND ENGINEERS

Phone 1-1-1-1 113 S. California St., STOCKTON, CAL.

San Francisco, Cal. Oakland, Cal. Los Angeles, Cal.

NEPAGE, McKENNY CO.

Electrical Engineers and Contractors

Phone Sutter 2369 149 New Montgomery St., San Francisco, Cal.

H. W. Fincke Geo. C. Derby

IDEAL HEATING & ENGINEERING CO.

FAN SYSTEMS FOR HEATING AND COOLING

General Sheet Metal Work Warm Air Furnaces
Ideal Air Washers Blow Pipe Systems

PHONE MARKET 3708 192 ERIE STREET, SAN FRANCISCO

MULLEN MANUFACTURING CO.

BANK, STORE AND OFFICE FIXTURES—CABINET WORK OF GUARANTEED QUALITY—BAR FIXTURES DESIGNED, MANUFACTURED AND INSTALLED

Telephone Market 8692 Office and Factory: 64 Raisch St., Bet. 7th and 8th, San Francisco

where wages of common laborers were $2.50 a day, is well below the average actual cost of road grading work where the grading includes shaping, finishing, watering and rolling the subgrade with a gasoline or steam roller. But each season brought its new crop of ignorant bidders, and even the better informed contractors underestimated the cost of the work.

This we know, not from the reports of the Highway Commission or its engineers, but from personal interviews with a great many of the contractors.

One is inclined to believe that, at "living prices," the 1490 miles already built would have cost fully 25 per cent more than they did cost, and that in consequence the state of California is several million dollars richer than it would have been had all the contractors been fully acquainted with the actual cost of road work.

Methods of Handling and Measuring Bulk Cement.

There is no argument needed to convince the contractor and engineer that the elimination of the package problem in connection with portland cement would result in economy and saving. The question which is uppermost in the minds of superintendents on the job is how to handle and measure bulk cement from the time it arrives in railroad cars until it finds its way into the charging hopper of the mixer.

There are several methods which have been successfully used, the choice of which depends upon the size of the job, railroad facilities and the general layout of the construction plant.

To those who have not used cement in bulk it may seem reasonable to suppose that it will be exceedingly dusty to handle. Experience has proved the contrary. Bulk cement in transit becomes packed so that on its arrival at destination a man can walk on the surface without sinking in to any appreciable depth. This packing makes it possible to shovel the cement with practically no amount of dust being raised. There are no sacks to be shaken and that is perhaps the most dusty operation in the handling of cement for construction work.

On work where cement is being used in quantities of half a car per day or more, and where the mixing plant is located within reasonable distance of the receiving siding, the simplest method of handling bulk cement is to shovel it directly from the car into wheelbarrows of known capacity and then through the provision of proper runways wheel the cement directly to the charging hopper of the mixer. Measurement, when this method of unloading and handling is used, can be effected in the same way

Heavy service demands

California Redwood

BLOCK PAVING

Economical—costs less to lay and has longer life than other pavings.

Durable—will stand the heaviest traffic and outlive asphalt, brick or concrete.

Noiseless, dustless, sanitary.

Maintenance costs practically nothing.

Easy on the feet of employes.

And Redwood contains a ***natural*** preservative—does not require ***artificial*** preservatives to insure long life.

Resists rot and fire. Permanent in shape.

Write today for free booklet, "California Redwood Block Paving," and full information.

CALIFORNIA REDWOOD ASSOCIATION

723 CALL BUILDING, SAN FRANCISCO

Basement of Palace Hotel, San Francisco Paved with California Redwood Block Paving.

When writing to Advertisers please mention this magazine.

that the measurement of coarse and fine aggregate is done. This method is applicable more properly to work of not very great size and where construction operations will cover only a comparatively short length of time.

Where railroad facilities and the size of the work warrant it, it is advisable to provide storage for cement. This may be made more advisable on account of car shortage or the liability of irregular shipment. The most commonly followed method where storage is provided is to unload the car of bulk cement by means of a power shovel. Shovels of the type used in handling grain can be used, but it has been found more practical and efficient to use a shovel of a scoop type, having sides and back so that the load first taken is retained. The flat shovel allows the cement to flow off either side and over the top and for this reason is less desirable. The shovel should be attached by cable to a motor or engine of from 7 to 10 horsepower. With this equipment 200 barrels can be unloaded from a car in three hours. The power shovel dumps the cement from the car into the boot of a bucket elevator which in turn raises it, discharging into the storage bin. This method should be followed where the floor of the storage bin is approximately on the level of or above the railroad track. If the track level is well above that of the storage, cement can be spouted from the car by gravity to storage.

On some work where the mixing plant has been located at a greater or less distance from the receiving tracks and the main cement storage, bins have been erected over the mixers for stone, sand and cement. These bins are so constructed as to hold sufficient material to insure the continuous operation of the mixing plant. Where this condition holds a belt conveyor from the main cement storage can be laid to the bins feeding the charging hoppers of the mixer. This belt conveyor can be fed by means of a screw conveyor running the length of the main cement storage.

Successful use has been made of automatic scales placed beneath the three material bins over the mixer for the accurate proportioning of mixes. The scales can be so set as to permit of any particular mix of concrete being delivered to the charging hopper.

The method above outlined—that is, the use of a power shovel and bucket elevator—is particularly applicable to the average plant manufacturing concrete products. It is evident that the construction of permanent storage facilities in such cases would be economical and efficient.

Thinks It An Unjust Levy.

A woman property owner in San Francisco has a complaint against the

THE FLOOR OF

Durability and Distinction

Double Diamond Interlocking Rubber Tiling

There is no other flooring quite as durable as **Double Diamond Interlocking Rubber Tiling.**

It adds greatly to the appearance of any space in which it may be placed.

It can be made in any combination of color or design to harmonize with interior decorations.

It is noiseless, non-slipping, waterproof, sanitary, and by long odds the most durable floor covering made.

Twenty Tons of It Installed in the New Standard Oil Building, San Francisco.

— For —

Banks	Hospitals
Office Buildings	Libraries
Churches	R. R. Depots

Theaters—Elevators—Residences

New York Belting and Packing Co.

New York

San Francisco Branch

519 MISSION STREET

Phone Douglas 1837

Small booklet of designs mailed on request.

Master Builders Method

Master Builders Method — with Master Builders Concrete Hardner — is standard practice the world over for the construction of concrete floors that are Dustproof, Wearproof and Waterproof. More than 21,000 satisfied users. Over 80,000,000 sq. ft. in every-day use. Makes the ideal type of floor for all buildings where floor service is essential and the elimination of dust is necessary. Send for our "Primer"—a complete text book on the subject of better concrete floors. Sent FREE, without obligation.

THE MASTER BUILDERS COMPANY

Makers of Master Builders Concrete Hardner; Master Builders Red Concrete Hardner; Master Builders Black Concrete Hardner; Readyte Concrete Hardner for Concrete Roads; Sanitcal Liquid Concrete Hardner.

Main Office and Works: CLEVELAND, OHIO.

AGENTS

Colvin & Hoskins
Spokane, Wash.
Raymond C. Grant
Helena, Mont.
Sam Hunter Co.
Seattle, Wash.
F. S. Cook & Co.
Portland, Ore.
C. Roman Co.
San Francisco, Cal.
A. E. Banks,
Los Angeles, Cal.
S. A. Roberts & Co.
Salt Lake City, Utah

Board of Public Works in that city. She had constructed a granite curbing in front of her property and this was in good condition. The city officials removed the stone curbing, put in its place concrete curbing, and then levied an assessment against her. It would seem as if the property holder had good cause for complaint. It is difficult to understand why granite work should be removed to make place for an artificial substitute and the citizen be penalized for putting in the better material.—Stone.

Houghton Company in New Offices

The Houghton Construction Company, formerly the Van Sant-Houghton Construction Company, has moved from the Hooker & Lent building to new offices on the tenth floor of the Flatiron building, 544 Market street, San Francisco. Mr. Shirley Houghton is president and manager of the company, which at the present time is busy constructing immense concrete snowsheds for the Southern Pacific Company. The improvements, it is said, will cost $500,000 or more.

Retires from Long Established Firm

The firm of Woods, Huddart & Gunn has been dissolved by mutual consent, Mr. Chas. M. Woods retiring from the firm. The business will be carried on as heretofore at the same place, 444 Market street, San Francisco, and under the same firm name by the remaining partners, Messrs. Fred. T. Huddart and Chas. M. Gunn.

Just Do Like Caesar Did

When Caesar took an eastward ride and grabbed the Gauls of Rome,
What was the first thing that he did to make them feel at home?
Did he increase the people's loads and liberty forbid?
No, he dug in and built good roads—that's what Old Caesar did.

Did Caesar put the iron heel upon the foeman's breast,
Or did he try to make them feel the Roman's rule was best?
What did he do to make them glad he'd come their midst amid?
He built good roads in place of bad—that's what Old Caesar did.

He built good roads from hill to hill; good roads from vale to vale;
He ran a good roads movement till Rome got all the kale.
He told the folks to buy at home, build roads their hills amid,
Until all roads led up to Rome—that's what Old Caesar did.

If any man would make the town the center of the map,
Where folks will come and settle down and live in plenty's lap;
If any town its own abodes of poverty would rid,
Let it get out and build good roads—just like Old Caesar did.

—Sentinel, Grenada, Mississippi.

DO YOU USE ANY HIGH GRADE

CABINET or HARDWOODS?

WE MAKE A SPECIALTY OF THEM

PRIMAVERA, MAHOGANY, KOA, JENISERO, OAK, ASH, ETC.

DIECKMANN HARDWOOD CO.

Beach and Taylor Streets, SAN FRANCISCO

Washington Grammar School, Redwood City, California

N. W. Sexton & Co., Architects

THIS PICTURE is one of 40 or more halftone plates that will be shown in THE ARCHITECT AND ENGINEER OF CALIFORNIA for September. The issue will be the Annual School Number and the illustrations will represent the Best that has been done in School Architecture on the Pacific Coast in the past three years. No work will be shown prior to that date, except for comparison. Floor plans and working drawings will be included, together with a scholarly article by Mr. H. G. Simpson.

This and all future numbers of THE ARCHITECT AND ENGINEER OF CALIFORNIA copyrighted.

Publication date September 20th. 25 cents a copy. Yearly subscription $1.50 in advance.

THE ARCHITECT AND ENGINEER
OF CALIFORNIA, Publishers
627-629 Foxcroft Building,
SAN FRANCISCO, CAL.

This is not a Chinese Dragon in a holiday parade, but a corrugated iron siphon used by the Fairview Canal Company, Rigby, Idaho, for conveying the water of one canal under that of another.

Developing Our Electrical Energy

Activity looking toward further development of electrical energy in California is proceeding on a scale that has not been equaled for years.

Some conception of the proportions to which these new plans are daily growing may be gathered from a brief rehearsal of some of the work now under way in California.

The Southern California Edison Company has a force of from one thousand to twelve hundred men working at Huntington Lake preparing to install a second unit of the giant Big Creek project.

The Sierra & San Francisco Power Company is installing an additional 9,000 kw. steam turbine in San Francisco.

The San Joaquin Light & Power Company has recently completed a power plant of about 6,000 kw. and contemplates the immediate installation of an additional 15,000 kw.

An extended enlargement in the long distance transmission system of the Southern Sierras Power Company is now under way, although this system is already the longest in the world.

The Pacific Gas & Electric Company, not content with its recent installment of 25,000 kw. put in from the Wise & Halsey plants, contemplates an additional 5,000 kw. at the Spaulding Dam, and, upon the Pit River in the north, an additional 150,000 kw. is being undertaken, which will double the output of the company's present eleven hydro-electric plants combined.

Master Plumbers Elect Officers

The State Association of Master Plumbers of California held its annual convention at San Diego last month. Frederick A. Heilbron of San Diego was elected president for the ensuing year, to succeed John Hokom of Los Angeles.

Other officers elected are as follows: A. Newman of Fresno, vice-president; Frederick A. Wilson of Los Angeles, treasurer; John L. E. Firmin of San Francisco, secretary; Vincent W. Guercio of Los Angeles, assistant secretary; executive board members, John Hokom, Los Angeles; Alexander Coleman, San Francisco; W. Herbert Graham, Oakland; Edgar R. Wright, Los Angeles.

Ira Byrnes of Los Angeles addressed the association, urging the plumbers to set a standard price for work and to require the payment of one-half the price when one-half the work is completed and the remainder when all work is completed.

$75,000 Apartment House

Mr. G. A. Applegarth, Claus Spreckels building, San Francisco, is preparing plans for a four-story Class C apartment house to be built for Mr. M. L. Marks at Sacramento and Buchanan streets. The improvements will cost $75,000.

KEWANEE
GARBAGE BURNERS AND BOILERS

YEOMANS
BILGE PUMPS
EJECTORS
HOUSE PUMPS

LOUDEN
SANITARY
BARN EQUIPMENT

CALIFORNIA HYDRAULIC ENGINEERING & SUPPLY CO., 80 Fremont St., S. F.

Phone MISSION 4405

P. R. WARD Formerly Ward & Goodwin
GENERAL CONTRACTOR
981 GUERRERO STREET SAN FRANCISCO

ONE PIECE SANITARY DRAINBOARDS, SINKBACKS, FLOORS, WAINSCOTING, ETC.
GERMANWOOD FLOOR CO.
Phone West 4009 1621 EDDY STREET, SAN FRANCISCO

HOWARD CO.
CEMENT, ROCK, PLASTER, GRAVEL, BRICK and SAND
Phone Lakeside 27 1st and Market Sts., Oakland

G. W. COURTNEY
CONTRACTOR
Phone Franklin 4800 160 EDDY STREET, SAN FRANCISCO

L. G. BERGREN & SON
GENERAL CONTRACTORS
347 CALL BUILDING SAN FRANCISCO, CAL.

PLUMBING HEATING
NEIL H. DUNN
CONTRACTOR
786 ELLIS STREET S. F. Phone Franklin 2187

J. B. CROWE
Glass of All Kinds
1372-74-76 TURK ST., SAN FRANCISCO Tel. West 1398

LANDSCAPE ARCHITECTS
NEAL T. CHILDS COMPANY Phone Sutter 4933
WE PLAN HOME GROUNDS AND REALTY TRACTS
TREE SURGERY AND CONSULTING FORESTRY
68 POST STREET
SAN FRANCISCO

Old California Pottery Razed

The huge smokestack at the Carnegie (Cal.) Brick & Pottery Works recently tottered and fell when a powerful charge of dynamite was set off at its base by the United Wrecking Company of San Francisco, which for the last year has been razing the plant, built a little over twenty years ago at a cost of $2,250,000. The stack, 232 feet high and 25 feet in diameter at its base, was one of the last big structures to be taken down at Carnegie.

Affairs of the owners of the Carnegie pottery were forced into the hands of a receiver several years ago, and about a year ago it was sold at a receiver's sale at the Stockton courthouse to the Gladding-McBean Company of San Francisco, which intended to wreck the property itself, but gave up the job and sold the plant to the United Wrecking Company of San Francisco.

Although the wreckers bid against the Gladding-McBean Company at the receiver's sale, they did so without knowing the real value of the property. In the process of wrecking, however, it was found that the plant possessed unexpected value. The kilns, instead of being merely lined with fire brick, were built entirely of this material, bonded together with fire clay, easily knocked off. Miles of underground iron pipe lines were also uncovered.—Exchange.

NePage, McKenny Company Busy

NePage, McKenny Company, electrical engineers and contractors, with offices in San Francisco, Seattle and in all of the principal coast cities, report business active in their lines. They report closing contract for complete electrification in the Oregon Washington dock, Seattle. The San Francisco office has closed a contract for the electrical equipment in the women's dormitory, Stanford University, at approximately $25,000; also contract for similar work in the Judson Iron Works at Oakland, amounting to about $30,000, and is installing electrical equipment for the Chevrolet Motor Car Company at Oakland, amounting to $60,000.

Send your order to headquarters.
Meese & Gottfried Company
SAN FRANCISCO, SEATTLE, PORTLAND, LOS ANGELES

CHARLES T. PHILLIPS
CONSULTING ENGINEER
PACIFIC BUILDING — SAN FRANCISCO
HEATING VENTILATION WIRING ILLUMINATION

THE NEW CARNEGIE LIBRARY, CIVIC CENTER, SAN FRANCISCO
Armco Iron used throughout for Metal Window Frames, Skylights and Metal Grills in large windows.
Geo. W. Kelham, Architect, Forderer Cornice Works, Sheet Metal Contractors.

California's handsomest buildings, public and private, embody

Rust-Resisting ARMCO IRON

Progressive architects and engineers specify and insist upon it for roofs, skylights, cornices, window frames, metal grills, pipe and trough and metal lath. Armco (American Ingot) Iron's unequalled ***purity*** and ***evenness*** have secured for it a definite place among ***long-service materials.***

AMERICAN ARMCO INGOT IRON

The trade mark ARMCO carries the assurance that iron bearing that mark is manufactured by The American Rolling Mill Company with the skill, intelligence and fidelity associated with its products, and hence can be depended upon to possess in the highest degree the merit claimed for it.

THE AMERICAN ROLLING MILL COMPANY
MIDDLETOWN, OHIO

Licensed Manufacturers under Patents granted to the International Metal Products Company

ARMCO Iron Sheets, Plates, Roofing, Pipe, Gutter and Metal Lath

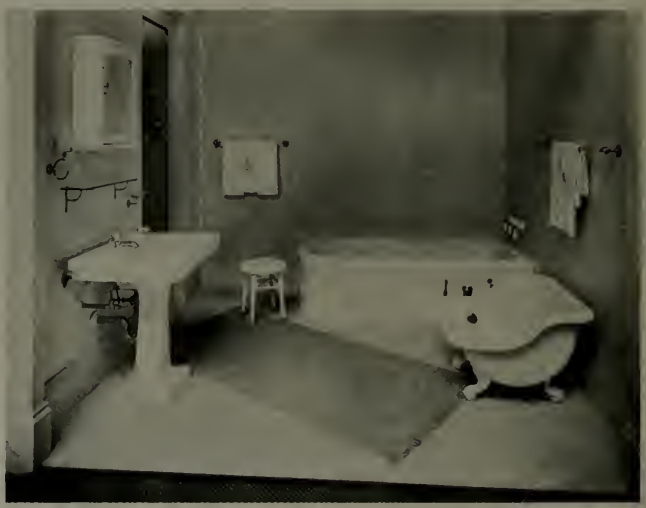
Pacific Coast Sales Office — Monadnock Building, San Francisco; other Branch Offices in New York, Chicago, Pittsburgh, Cleveland, Detroit, St. Louis, Cincinnati, Atlanta, and Washington, D. C.

AN AMPLE STOCK OF ARMCO IRON IS CARRIED AT SAN FRANCISCO.

PLUMBING GOODS

GOODS OF QUALITY HM&S

OF QUALITY



REFINEMENT and ELEGANCE Distinguish the Bath room Fixtures shown in this picture. It is a photograph of one of several Bath rooms which may be seen under Water Pressure at our New Up-Town Display Room, 64 Sutter Street, San Francisco. Architects and others interested in High Grade Plumbing Fixtures are Cordially Invited to Call.

Holbrook, Merrill & Stetson

DEALERS IN

PLUMBERS' SUPPLIES, IRON PIPE AND FITTINGS, METALS
STEAM, WATER AND HOT AIR HEATING APPARATUS
STOVES, RANGES AND KITCHEN UTENSILS

Main Office and Warehouse

SIXTH, TOWNSEND AND BLUXOME STREETS, SAN FRANCISCO

Oil Burning Equipment for School Boilers

Mr. E. P. Pratt, department mechanic for the Board of Education of Berkeley, has gathered some interesting statistics on the relative cost of heating school houses with oil and with coal.

During a period of five years Mr. Pratt kept a record of the cost of heating the Longfellow school building and found that the average cost per year was $167.80. More or less trouble was experienced continually in heating this building, and in the spring of 1915 Mr. Pratt asked permission to install an oil burner on trial. The board consented and a burner was installed and operated during the winter of 1915-16 at a cost of $70. The building was kept at a uniformly satisfactory temperature. There was no dust or ashes and a minimum of labor was required in keeping a proper head of steam. The amount given for heating the building was not really what the oil cost, and forty-five barrels of oil were placed in the tank on the last day of June so as to take advantage of a contract of 60 cents per barrel. Up to the end of January, 1917, the sum of $42 has been spent for additional oil to heat this building, and the amount of oil on hand will carry the building for the remainder of the winter. The cost for the two years will thus be $112 as against $327.60 for the two previous winters when coal was used. The cost of coal in Berkeley is 9.38 per ton.

Mr. Pratt has devised a simple method of checking the deliveries of oil to prevent shortages and overcharges. The oil tanks in the school house basement measure 5 feet by 14 feet and contain 2,050 gallons. Each

A Dependable Door Device

Hundreds of Architects all over America have for years specified

RELIANCE BALL BEARING DOOR HANGERS

because of their proven satisfaction. Are you among them? If not, write us at once and you will soon be in position to join the mighty host of architects who are "Reliance" Hanger friends.

The principle of construction of the "Reliance" Hanger provides against complicated and expense-creating parts. It involves the use of only two or three telescoping pieces of steel with balls between.

Lowest Possible Maintenance Cost and Installation Expense, and Longest Possible Service

Write for Catalog

RELIANCE BALL BEARING DOOR HANGER CO.

70 EAST 45th ST., NEW YORK

PACIFIC COAST AGENTS

B. V. Collins.....Los Angeles, Cal.
Sartorius Co.....San Francisco, Cal.
Columbia Wire & Iron Works....Portland, Ore.
D. E. Fryer & Co., Seattle, Spokane and Tacoma, Wash., Great Falls, Montana.

MODERN PLUMBING FIXTURES

HAINES, JONES & CADBURY CO.
MAKERS OF PLUMBING SUPPLIES
1130-1144 RIDGE AVENUE PHILADELPHIA
BRANCHES - SAVANNAH AND SAN FRANCISCO
San Francisco Office and Showroom
857 Folsom Street

H. H. LARSEN, 101 Woodland Ave. N. LARSEN, 230 Haight St.
H. H. LARSEN & BRO.
MASONS and BUILDERS
Phone Douglas 4249 Office 62 POST ST., Room 331, San Francisco

ROBERT TROST PHONE MISSION 2209
General Building Contractor
We Specialize in High Grade Work and Employ Skilled Labor in every Branch of the Building Industry.
26th and Howard Streets
SAN FRANCISCO

Atlas Heating and Ventilating Co., Inc.
ENGINEERS and CONTRACTORS
STEAM AND HOT WATER HEATING, FANS, BLOWERS, FURNACES, POWER PLANTS--SHEET METAL WORK
Phone Douglas 378 Fourth and Freelon Sts., Bet. Bryant & Brannan, SAN FRANCISCO.

L. DIOGUARDI, Phone Randolph 2479 CHAS. TERRANOVA, Phone Randolph 2362
DIOGUARDI & TERRANOVA
GENERAL BUILDING CONTRACTORS
Office, 616 Westbank Bldg., 830 Market St., San Francisco Phone Garfield 1907

HEATING VENTILATION
Automatic Sprinkler Systems
FLOOR AND WALL TILING
PLUMBING SHEET METAL WORK
SCOTT CO., INC.
SUCCESSOR TO JOHN G. SUTTON CO.
243 MINNA STREET SAN FRANCISCO

BARRETT & HILP
Concrete Construction & General Contractors
SHARON BUILDING SAN FRANCISCO SUTTER 4598

Dolan Wrecking & Construction Co.
(D. J. DOLAN)
Lumber, Lath, Nails, Shingles, Doors, Windows and Plumbing Supplies, New and Second Hand
Phone Market 4264 Office and Yard, 1607-1639 MARKET ST., SAN FRANCISCO

When writing to Advertisers please mention this magazine.

janitor has a measuring stick which shows just how many gallons are in the tanks. When a consignment of oil arrives the janitor measures the oil remaining in the tank, and when the delivery has been made he again takes a measurement. By deducting the first from the second amount he can quickly figure the actual amount of oil delivered. By comparing the drivers' delivery slip with his own checking he can readily tally the bill.

Group Life Insurance for Berry Bros.' Employees

The following general letter, addressed to all employees of Berry Bros., well-known manufacturers of varnishes, has been received by the entire working force of the company with great enthusiasm, and the employees feel extremely grateful to President O. S. Goan for his beneficent interest in their behalf. The plan might well be adopted by other large corporations:

By the unanimous action of our board of directors, the company has arranged for what is known as "group life insurance," covering all of its employees, upon the following conditions:

Any employee, no matter where located, who has been in the service of the company for six months, thereby establishing permanency of employment, is insured for $500.

Any employee who has been in the service of the company for one year and six months is insured for $600.

Additional insurance will apply for each additional year of employment until a maximum of $1,000 has been reached.

Under this arrangement, therefore, all those employees who have been in the service of the company five years and six months are insured for $1,000.

You, therefore, are requested to fill in the enclosed blank and return the same promptly.

As soon as possible after all of these forms have been received, a certificate of insurance will be sent to each employee, free of any expense whatever, and the same will remain in effect so long as the employment continues. The general policy is contracted for and the insurance is now in effect.

We wish to add that we are taking this action as an evidence of our appreciation of the faithful service rendered by a large number of employees for many years past, and our desire to encourage younger employees in the belief that their faithful efforts will be duly appreciated and properly recognized.

Yours very truly,

BERRY BROTHERS.

Buttonlath for Army Buildings

Buttonlath will be used on two of the U. S. Army post buildings to be erected at Ft. MacArthur, San Pedro, by J. F. Atkinson. The buildings designated are one officers' quarters and one barrack building, both of which are two stories. Considering the ultra conservatism of the federal government in taking up new building materials, this concession, which is in the nature of a practical experimental test, is indicative of a favorable attitude on the part of Uncle Sam toward this meritorious California product.

BEAVER BLACKBOARD
BEAVER GREENBOARD
SCHOOL FURNITURE
AND SUPPLIES—
OFFICE, BANK AND
COURTHOUSE FURNITURE—
THEATRE AND
AUDITORIUM SEATING
Rucker-Fuller Desk Co.
677 Mission St., SAN FRANCISCO, CAL.
120 So. Spring St., LOS ANGELES, CAL.
432 - 14th Street - OAKLAND, CAL.

JOHN CHANNING
EXPERIENCED IN PHOTOGRAPHY
FOR ARCHITECTS AND ENGINEERS
Commercial
PHOTOGRAPHY
All Branches
TEL. FRANKLIN 8875
Dean Building, San Francisco

FOR SALE
PENDING Reorganization of The Colorado Yule Marble Company, we offer for sale an unlimited quantity of rough White Veined Marble Blocks. Special price for quarry selection.
Communicate with
J. F. MANNING, Receiver,
MARBLE, COLORADO.

Western Vacuum Supply Co.
CALIFORNIA AGENTS FOR
Palm Vacuum Cleaners
ANY SERVICE
ANY CAPACITY
Plants Noiseless in Operation
Office and Demonstrating Room:
1125 Market St. Telephone Park 4294
Rialto Theatre Building San Francisco

A Movable Lot

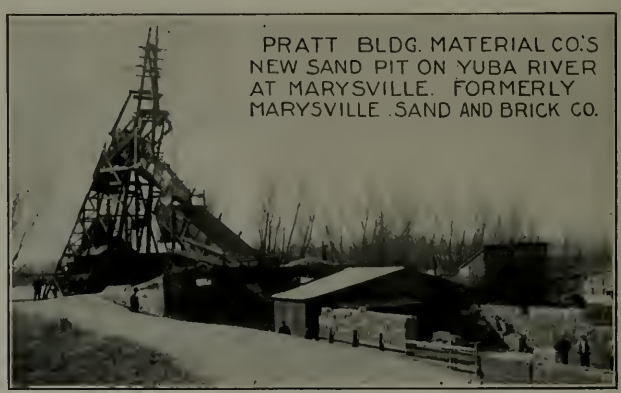
Suit has been filed by Mr. J. H. Smith, reputed owner of a lot at the south portal of the N. Broadway tunnel, Los Angeles, asking $15,000 damages from Contractor Lynn S. Atkinson on the charge that Atkinson, in performing his contract, packed up and bodily moved away part of his lot. Smith claims the lot was his private property, but that it had come to be recognized as a public thoroughfare by usage as such, the person from whom he had purchased it having allowed a strip of the property to be used for entrance and exit to and from the remainder of his property. This portion of the property, he says, was excavated away in rebuilding the tunnel.

New Sanitary Plant for Pacific Coast

The Universal Sanitary Manufacturing Company, which operates a plant at New Castle, Pa., has made arrangements for the construction of a large sanitary ware plant at Torrance, Cal., which, according to present indications, will be completed in about six months. Mr. Charles J. Kirk, president of the company, was recently in California arranging for the erection of the buildings. The plant is to be very similar to the one at New Castle and will employ continuous muffle kilns in the burning of its ware. Seemingly inexhaustible supplies of clay are available and it will be possible for the new plant, because of the climate, to operate throughout the year. According to Mr. Kirk, the output of the new factory will reach the two million dollar mark in two years, and in preparation for this immense production, an "expansion joint," in the form of ten additional acres of land, has been provided.—Exchange.

White Bros.' New Stock List.

White Brothers, Fifth and Brannan streets, San Francisco, have just published their July, 1917, Stock List of Hardwoods. Besides listing the largest and most complete stock of hardwoods on the Pacific Coast, the booklet contains the weights of the different hardwoods, the botanical name and habitat of each. Scribner's table for the measurement of hardwood logs, Spaulding's table for the measurement of Pacific Coast grown logs, and also a table for the measuring of hardwood lumber. As hardwood lumber is measured with a board rule and every quarter of an inch in width is figured in, the buyer sometimes finds it a very tedious task to figure or check up the exact footage, so White Brothers have made up this table for his convenience and it is sure to fill a long-felt want.



LOADING SAND FROM YUBA RIVER AT MARYSVILLE

The Pratt Building Material Company, C. F. Pratt, President, ship **Marysville sand** as far north as Oregon and south to Modesto, San Jose, San Francisco and other points.

Architects, engineers and contractors say that **Marysville sand** is the best sand in California for concrete work and plastering.

Phone for sample to **Pratt Building Material Company**, Hearst-Examiner building **Douglas 300. "Easy to remember."**

FOR THE ARCHITECT

Who specifies a "PITTSBURG" Automatic Gas Water Heater — he is confident that his judgment will be commended.

FOR THE CUSTOMER

Who purchases a "PITTSBURG" Automatic Gas Water Heater — he is assured beyond a doubt of many years of satisfactory Hot Water Service.

PITTSBURG WATER HEATER COMPANY of California
478 Sutter St., San Francisco 402 15th St., Oakland

A Big Thing

New Model No. 65 "Pittsburg-Bungalow" Automatic Water Heater, Capacity three gallons per minute.

"Chief Sentry" Gasoline Outfit

BOWSER ESTABLISHED 1885

Oil and Gasoline Storage Systems

Are specified in modern garages. Include Bowser Equipment in your plans. It means satisfied clients for you because of the saving, safety and complete convenience of the Bowser System.

Write or 'phone us. We will be glad to co-operate with you in planning oil storage systems for all classes of buildings.

S. F. Bowser & Co., Inc., Ft. Wayne, Ind., U. S. A.

San Francisco Office
612 Howard St.

Telephone
Douglas 4323

FOXCROFT BUILDING, 68 Post Street, San Francisco. Offices Single and in Suite.

HOTEL WHITCOMB

AT THE

CIVIC CENTER

OF

SAN FRANCISCO

¶ Free Garage for Guests.

¶ Dinner in the Arabesque Room, one dollar.

¶ Dancing in the Sun Lounge every Evening except Sunday.

¶ Room with bath, one-fifty and up.

¶ American and European.

J. H. VAN HORNE, Manager

Back East Excursions

SALE DATES:

August 28, 29.
September 4, 5.

SOME FARES:

(Direct Routes)

Denver, Pueblo	$ 62.50
Omaha, Kansas City	67.50
Dallas, Houston, San Antonio	70.00
New Orleans, Memphis, St. Louis	77.50
Chicago	80.00
Minneapolis, St. Paul	84.45
Washington, D. C., Baltimore	146.00
New York, Philadelphia	148.20
Boston	120.20

Proportionately low fares to many other points.

Going Limit—15 days; Return Limit—3 mos. from date of sale (but not later than Oct. 31).

STOPOVERS: Going—east of Calif. state line; Returning—at all points. See Agents.

SOUTHERN PACIFIC

Write for folder on the Apache Trail of Arizona.

Johnson Multiple Disc Rotary Oil Burner

A Perfect Atomizer of Heavy Crude Oil

For Hotels, Apartment Houses, Office Buildings, Schools and Residences. Send for Information

S. T. JOHNSON COMPANY

San Francisco Oakland Los Angeles

C. DRUCKER J. C. JAMES

JAMES & DRUCKER

PLUMBING—HEATING
CONTRACTORS

Phone
Market 275

450 Hayes Street
San Francisco

ESTABLISHED 1858

MUELLER

High Grade Faucets

FOR

BATH, LAVATORY AND SINK

Give Long Service, Cut Out Repairs, Fully Warranted

H. MUELLER MFG. CO.

589 Mission St., SAN FRANCISCO

Phone Douglas 3224

Hunter & Hudson

ENGINEERS

Designers of Heating, Ventilating and Wiring Systems. Mechanical and Electrical Equipment of Buildings.

729 Rialto Bldg., San Francisco, Cal.

MARK-LALLY CO.

PLUMBING and STEAM SUPPLIES

"PERFECTION"
FLUSH VALVES

SHOWROOMS AND OFFICE

235-249 2nd St., San Francisco
CALIFORNIA

OAKLAND
SAN JOSE

Branches

FRESNO
STOCKTON

PHONE FRANKLIN 5598

THE TORMEY CO.
Versatile Decorators

General Painters
Wall Paper

681 Geary St. San Francisco, Cal.

Phone Sutter 2419

JOHN MONK

GENERAL
CONTRACTOR

316 Sharon Bldg. San Francisco

The McGilvray Stone Company

MASONRY AND STONE CONTRACTORS

OPERATING

Duntrune Quarry, at Sites, Colusa County, Cal.

The McGilvray Raymond Granite Co.

CONTRACTORS

For and Dealers in Granite Work of Every Description

Quarries at Raymond, Cal.

Offices, 634-666 Townsend Street, San Francisco

Phone Garfield 361

A. P. BRADY

Builder

Humboldt Bank Building
San Francisco, Cal.

Phone Sutter 1687

THE RIGNEY TILE CO.

Successors to

CALIFORNIA TILE CONTRACTING CO.

ESTIMATES FURNISHED

Sheldon Building
1st and Market Sts. SAN FRANCISCO

"BLAZING" THE TRAIL

We've been doing it for many years—giving the Sportsman Better Value for Quality than he ever before received. *"Value at a Fair Price"* in everything for the Sportsman.

The Ellery Arms Company
583-85 MARKET ST
SAN FRANCISCO, CAL

SEND FOR CATALOG *The Sign of Quality*

National Surety Company of New York

ASSETS OVER $12,000,000.

The bonds of this Company are accepted by the United States Government in larger amounts than any other Surety Company in the World.

PACIFIC COAST DEPARTMENT,
105 MONTGOMERY STREET,
SAN FRANCISCO, CAL.
Frank L. Gilbert, Vice-President.
Phone, Sutter 2636

KEWANEE WATER SUPPLY SYSTEMS

A Perfect Water Supply to Country Homes, Hotels and Parks.

SIMONDS MACHINERY CO.
117-121 New Montgomery St., San Francisco

Interior Decorations a Specialty
Drapes, Sketches, Color Schemes Furnished on Request

Golden Gate Decorating Co.

704 Polk Street, at Eddy, San Francisco. Tel. Prospect 2685
R. L. McQUADE, Manager

Expert Designers in Home Decorations

House Painting, Graining, Glazing
Expert Paper Hanging
Apartment and Hotel Work a Specialty
Prompt Service—All Work Guaranteed

A. J. FORBES & SON

Established in San Francisco in 1850

Office and Factory, 1530 FILBERT ST., S. F.
Builders Ex. Box 236

Bank, Store and Office Fittings

Special Furniture and Interior Woodwork

MAGNER BROS.

PAINT MAKERS

Floratone Flat Wall Paint
Mabro Concrete Paint
Concrete Floor Paint
Mabro Stipple Paint
Mabro Enamels and Enamel Undercoaters

419-421 Jackson Street,
SAN FRANCISCO, CAL.

Guaranteed Results in Waterproofing and Hardening Concrete, Brick, Stone, Etc.

by the

GOFFETTE PREPARATIONS

A perfectly successful, simple and inexpensive method of waterproofing and hardening concrete, brick and stone has been worked out by Prof. J. L. Goffette, a Belgian chemist and engineer of high standing.

Rights of manufacture and sale have been secured by the undersigned and a factory established in San Francisco.

GOFFETTE WATERPROOFING is a liquid, mineral flux of high penetrative power and of absolute waterproofing effect. Being mineral it is unaffected by any weather or organic influences. It becomes indissoluble with the material and its results are positive and permanent.

GOFFETTE HARDENER, by a process of supplemental crystallization gives a flint-like surface to even the softest and most porous concrete, increasing the tensile and compressive strength from 200 to 500 per cent. It fills all voids and becomes an insoluble and integral part of the material.

Both are used as after-applications; sprayed or brushed on. **NOT USED IN THE MIX.**

We solicit opportunity to submit tests and testimonials. Contracts for waterproofing walls, tanks, basements, etc. and for hardening floors are taken WITH BOND for satisfactory results.

THE GOFFETTE SALES ASSOCIATION, General Sales Agents, 276 Monadnock Bldg. San Francisco.

R. E. G. KEENE, Distributor for Northern California, 110 Jessie Street, San Francisco. Phone Sutter 3580.

MANUFACTURED BY THE

J. L. GOFFETTE CORPORATION

Factory and Warehouse, San Bruno Ave., San Francisco

Territory is open for responsible state or district sales agents, correspondence invited. Address GOFFETTE SALES ASSOCIATION, 276 Monadnock Building, San Francisco.

THE FISH FUEL SYSTEM

The Safest, Cleanest, Hottest Fuel on Earth

This SYSTEM supplies Heat, Light and Power at Lowest Cost. A Commercial Plant in operation at 50-54 – 8th St., San Francisco. Telephone Market 4070.

UNION GAS-ELECTRIC COMPANY

PALACE HOTEL SAN FRANCISCO

VAN EMON ELEVATOR CO.

Incorporated

Electric (1-1 and 2-1) Gearless Traction Elevators, Electric Geared Elevators, Full Automatic Electric Elevators and Dumb-Waiters, Hydraulic, Belt and Hand Power Elevators for Every Service

Telephone Sutter 3540 54 Natoma Street, San Francisco

Architects and Building Contractors

THE BINDING OF YOUR MAGAZINES and PERIODICALS IS OUR SPECIALTY

Expert Plate and Map Mounting

THE HICKS-JUDD COMPANY

BOOKBINDERS

51-65 FIRST STREET SAN FRANCISCO, CAL.

August F. Fick Albert E. Fick

FICK BROTHERS

PAINTERS, PAPER-HANGERS AND DECORATORS

Dealers in Paints, Oils, Varnishes, Glass

475 HAIGHT ST., San Francisco

Phone Park 4428—Res. Park 2148

When writing to Advertisers please mention this magazine.

TELEPHONE AND SIGNAL SYSTEMS TO MEET ALL INTERCOMMUNICATING CONDITIONS

Installed and Maintained

SIERRA ELECTRIC CONSTRUCTION CO.

Telephone and Signal Engineers

WESTERN REPRESENTATIVES

"The National Calling System"

AN IMPROVED SIGNAL SYSTEM FOR FINDING MEN INSTANTLY, WHEREVER THEY MAY BE ABOUT THE PLANT.

NORTHERN CALIFORNIA REPRESENTATIVES

"Hartung Hospital Silent Call System"

THE MOST "UP-TO-THE-MINUTE" HOSPITAL CALLING SYSTEM.

Let Us Send You Catalogues, or Have Our Representative Call on You

Sierra Electric Construction Co.

H. H. VAN LUVEN, Mgr.

619 CALL BLDG,. SAN FRANCISCO Phone Sutter 2297

"FIRE—A CRIME"

We are equipped with two Pacific Coast Factories to manufacture
METAL DOORS—Tin, Kalamein, Composite, Hollow Steel and Bronze,—Swinging, Sliding, Folding, Elevator, Van Kannel Revolving Doors, and Wilson's Steel Rolling Doors.
METAL WINDOWS—Underwriters, Hollow Metal of all kinds, Kalamein, Bronze and Steel Sash.
☞ See the SIMPLEX METAL WINDOW.

United States Metal Products Co.
OF THE PACIFIC COAST
555 Tenth St., San Francisco 750 Keller St., Los Angeles
Agents and Branches in all Coast Cities.

POPE & TALBOT

Manufacturers, Exporters and Dealers in

Lumber, Timber, Piles, Spars, etc.

Office, Yards and Planing Mills
FOOT OF THIRD ST., SAN FRANCISCO, CAL.
Mills, Port Gamble, Port Ludlow and Utsalady, Washington

A. S. MANGRUM, PRES. AND MGR.

MANGRUM & OTTER
(INCORPORATED)

TILING MANTELS GRATES | FURNACE AND STEAM HEATING

HOTEL AND KITCHEN OUTFITS
Stoves, Ranges, Refrigerators, Tin and Enameled Ware

Telephone, Kearny 3155 561-563 Mission St., San Francisco

DENISON INTERLOCKING TILE

and all kinds of
CLAY PRODUCTS

Phone MAIN 2028

CANNON-PHILLIPS COMPANY
Incorporated
Successors to DENISON BLOCK COMPANY

Plant North Sacramento 920 FORUM BUILDING SACRAMENTO, CAL.

STANDARD VARNISH WORKS
NEW YORK CHICAGO LONDON
SAN FRANCISCO PARIS BERLIN BRUSSELS MELBOURNE
INTERNATIONAL VARNISH CO. Limited TORONTO
LARGEST IN THE WORLD AND FIRST TO ESTABLISH DEFINITE QUALITY STANDARDS

TRADE ELASTICA MARK.

ELASTICA —No 1—

ELASTICA —No 2—

Architectural Varnishes

One for every class of work

ELASTICA Floor Finish

ELASTICA Cabinet Finish

Satinette ENAMEL

IMMACULATE

KLEARTONE Stains

BERRY BROTHERS' CELEBRATED VARNISHES DETROIT

A Common Sense Suggestion

If the owner is interested enough to select the wood he desires for his interior trim, surely equal care should be taken to get the finish that will bring out the beauty of the wood and preserve it.

To anyone who would like more tangible evidence as to the character of our "Finishes" we will be pleased to mail, postpaid, finished specimens of wood, bearing printed labels showing how the finishing was done.

BERRY BROTHERS
INCORPORATED
World's Largest Varnish Makers

250-256 FIRST STREET, SAN FRANCISCO, CAL.

DETROIT CHICAGO NEW YORK WALKERVILLE, ONT.

FOR YOUR WATER-PROOFING SPECIFY **TIGEROIL**

EQUALLY GOOD FOR IRON, SHEET METAL OR WOOD
A POSITIVE RUST PREVENTIVE AND WOOD PRESERVER

"Tigeroil" is one of the best waterproofing coatings known. It forms a hard, elastic, non-porous coating and is not affected by either salt or fresh water.

It is a transparent preparation, easily applied to metallic surfaces by spraying, brushing or dipping. It forms a thin waterproof coating, guaranteed to exclude all moisture and prevent rust. SAMPLES AND PRICES ON REQUEST. Manufactured by

PACIFIC COAST PAINT CORPORATION
OAKLAND, CALIFORNIA

General Offices and Factory — San Francisco Office
1111 to 1119 E. 11th St. Phone Merritt 407 — 112 Market St. Phone Sutter 2690

Clinton Welded Wire Fabric

CLINTON WIRE LATH

L. A. NORRIS COMPANY

Phone Kearny 5375 — 140 Townsend Street, San Francisco

The PARAMOUNT GAS RADIATOR

The Gas Radiator Without a Fault.

Manufactured and Sold by

Modern Appliance Co.

SAN FRANCISCO

128 Sutter St. — Phone Sutter 5670

OUR LEADING CIGAR BRANDS

FLOR DEL MUNDO
ALL HAVANA TOBACCO

FLOR DE UPMANN
A MILD, PLEASING BLEND

Goldberg, Bowen & Co.

SAN FRANCISCO — OAKLAND

When writing to Advertisers please mention this magazine.

There are more Industrial Buildings under construction and being planned in California today than ever before. Many of them are concrete.

Architects and Consulting Engineers specify and Contractors Buy ONLY Clean Gravel and Crushed Rock for their Concrete Mix.

California Building Material Co.

Office, 500-4 NEW CALL BUILDING, SAN FRANCISCO

Phone Sutter 4845 Plant at Niles, Cal.

ROBERT W. HUNT JNO. J. CONE JAS. C. HALLSTED D. W. McNAUGHER

ROBERT W. HUNT & CO., ENGINEERS

BUREAU OF INSPECTION TESTS AND CONSULTATION

251 KEARNY ST., SAN FRANCISCO

NEW YORK LONDON CHICAGO PITTSBURGH ST. LOUIS SEATTLE TORONTO MEXICO CITY

CEMENT INSPECTION

INSPECTION OF STRUCTURAL AND REINFORCING STEEL

REPORTS AND ESTIMATES ON PROPERTIES AND PROCESSES

CHEMICAL AND PHYSICAL TESTING LABORATORIES

MOUNT DIABLO CEMENT

COWELL SANTA CRUZ LIME

ALL KINDS OF

BUILDING MATERIALS

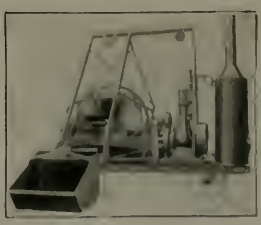
HENRY COWELL LIME AND CEMENT CO.

Phone Kearny 2095 No. 2 MARKET STREET, SAN FRANCISCO

AUSTIN IMPROVED CUBE CONCRETE MIXERS

Made the World's Best Records on the Panama Canal and the Los Angeles Aqueduct.

Built in ten sizes 2½ to 64 cubic feet capacity. "Special machines for street and road paving."



MEMBER OF NATIONAL ASSOCIATION MIXER MNFRS

Our Mixer Capacities Based on N. A. M. M. Wet Batch Rating

Municipal Engineering and Contracting Co.

Main Office, Railway Exchange, CHICAGO

Represented by J. H. HANSEN & CO.

BALBOA BLDG., San Francisco. Telephone Douglas 726

GEO. S. MacGRUER
258 Connecticut St. Phone Park 7700

ROBERT M. SIMPSON
483 Monadnock Bldg. Phone Douglas 5889

MacGRUER & CO.

CONTRACTING PLASTERERS
PLAIN AND ORNAMENTAL

Members Builders Exchange
180 Jessie St. Phone Sutter 6700

SAN FRANCISCO

WM. F. WILSON COMPANY

MODERN SANITARY APPLIANCES

Special Systems of Plumbing for Residences, Hotels, Schools, Colleges, Office Buildings, Etc.

Phone Sutter 357

328-330 Mason Street, San Francisco.

A. C. SCHINDLER, President

CHAS. F. STAUFFACHER, Secretary

THE FINK & SCHINDLER CO.

Manufacturers of INTERIOR WOODWORK AND FIXTURES
BANK, OFFICE AND STORE FITTINGS
SPECIAL FURNITURE

218-228 THIRTEENTH ST.
Bet. Mission and Howard Sts.

SAN FRANCISCO, CAL.
Telephone: Market 474

J. A. Nelson
J. C. Hurley

J. C. HURLEY CO.

Telephone
Garfield 1959

CONSTRUCTING ENGINEERS

Heating and Ventilating Systems

509-511 Sixth St., SAN FRANCISCO

Underwriters' Labeled Fire Doors and Windows— Kalamein Interior Metal Doors and Trim — Metal Corner Bead — Metal Furniture, etc.

Capitol Art Metal Co., Inc.

Manufacturer of

SHEET METAL PRODUCTS

San Francisco Office, 400-406 NEW CALL BUILDING Tel. Sutter 6553
Factory, RICHMOND, CALIFORNIA

AUXILIARY UNITS TO HOOSIER CABINET

Cupboard, Cooler, Chest and Drawer Units furnished in sections so one or all can be added to Regular Cabinet, thus making the HOOSIER a full Kitchen Equipment.

Architects and Builders will be furnished free full details, measurements and blue prints of this ideal method of equipping kitchens.

THE HOOSIER MFG. CO., New Castle, Ind.

Branch, 1067 MARKET ST., SAN FRANCISCO Telephone Market 8854

Phone Franklin 548

I. R. KISSEL

Decorator, Painter and Paperhanger

1747 SACRAMENTO ST., Bet. Polk St. and Van Ness Ave., SAN FRANCISCO

BURT T. OWSLEY

GENERAL CONTRACTOR

180 JESSIE STREET SAN FRANCISCO

For Modern RESIDENCES *and* APARTMENTS

PROMETHEUS

The Electric Food and Plate Warmer

Tenants of high-class apartments regard Prometheus as a household necessity—as much so in keeping meals warm as the refrigerator in keeping food cold.
Owners are installing Prometheus as an additional means of securing new and holding old tenants.
Prometheus keeps the meal steaming hot without injuring finest china. Wireless heating units of practically unlimited life, placed independent of shelves, are used exclusively.

THE PROMETHEUS ELECTRIC CO., Manufacturers
M. E. HAMMOND, 217 Humboldt Bank Building, San Francisco

S. P. McCLENAHAN

ARBORCULTURIST

GRADUATE—TREE SURGERY
SPRAYING
ORCHARD WORK

738 MERCHANTS EXCHANGE BLDG
Kearny 4457
SAN FRANCISCO

STERLING MOTOR TRUCKS

A complete line in stock for immediate delivery.

EDWARD R. BACON COMPANY, Pacific Coast Agents
51-53 Minna Street, San Francisco — Telephone Sutter 1675

O'HARA & LIVERMORE

Designers of

INTERIOR DECORATION

IN ALL ITS BRANCHES

- STUDIOS AT -

522 Sutter Street
SAN FRANCISCO, CAL.
Tel. Sutter 284

253 E. Colorado Street
PASADENA, CAL.
Fair Oaks 2175

When writing to Advertisers please mention this magazine.

HEATING-PLUMBING

COMPLETE PLUMBING AND HEATING SYSTEMS INSTALLED IN ALL CLASSES OF BUILDINGS ALSO POWER PLANTS

GILLEY-SCHMID CO., Inc.

198 OTIS STREET, SAN FRANCISCO.
Tel. MARKET 965

Phone Franklin 1006

Alex. Coleman

CONTRACTING PLUMBER

706 Ellis Street, San Francisco, Cal.

CALIFORNIA PHOTO-ENGRAVING CO.

DESIGNERS & ENGRAVERS ILLUSTRATORS ARTISTS

BOOKLETS FOLDERS

121 SECOND ST. SAN FRANCISCO

McCRAY REFRIGERATORS

BUILT TO ORDER
FOR
Home, Restaurant, Hotel or Club

We Carry a Full Line of Stock Sizes

NATHAN DOHRMANN CO.
Selling Agents
Geary and Stockton Sts., San Francisco

W. C. DUNCAN & CO.

General Contractors

508 Sharon Bldg. San Francisco

THE SPENCER TURBINE VACUUM CLEANER

SAVES MONEY

Easily installed in old as well as new buildings—Operates by Electricity—Twelve sizes ranging from $\frac{1}{2}$ to 40 horse power.

HUGHSON & MERTON CO.
AGENTS
530 Golden Gate Ave.
San Francisco

SIMPLEX STANDARD CRUDE OIL BURNERS

Safety First
Simplicity Next
Efficiency and Quality all the Time
1916 Model—Price Right

Write to
American Standard Oil Burner Co.
7th and Cedar Sts. OAKLAND, CAL.

Locks and Hardware

Representative for LOCKWOOD MFG. CO'S Builders' Hardware.

Display Rooms—7th and TOWNSEND STREETS, San Francisco

PACIFIC HARDWARE & STEEL CO.

The Granite Work on Eldorado County Courthouse; National Bank of D. O. Mills, Sacramento;—and Sen. Nixon Mausoleum, Reno, WAS FURNISHED BY

CALIFORNIA GRANITE COMPANY

Phone Sutter 2646 STONE CONTRACTORS Main Office, Rocklin, Placer Co., Cal.

San Francisco Office, 518 Sharon Bldg. Telephone Main 82

Quarries, Rocklin and Porterville

SARGENT

REG. U. S. PAT. OFF

BUILDING HARDWARE

BENNETT BROS.

514-516 Market Street

SAN FRANCISCO - CAL.

E. E. CARNAHAN
1403 McAllister St., Phone West 3608

E. S. MULFORD
1282 Sacramento St., Phone Franklin 8776

CARNAHAN & MULFORD

GENERAL CONTRACTORS

Telephone Kearny 4195 504 LUNING BLDG. 45 Kearny St., San Francisco, Cal.

O. BAMANN, President ERNEST HELD, Vice-President

HOME MANUFACTURING CO.

BANK, STORE AND OFFICE FITTINGS
FURNITURE AND HARDWOOD INTERIORS
CABINET WORK OF EVERY DESCRIPTION

543 and 545 BRANNAN ST. Phone Kearny 1514 San Francisco, Cal.

PACIFIC MANUFACTURING COMPANY

MILLWORK, SASH AND DOORS

Hardwood Interior Trim a Specialty

MAIN OFFICE:
SANTA CLARA, CAL.

SAN FRANCISCO OFFICE, 177 Stevenson Street
OAKLAND.....486 Tenth Street
BERKELEY.....2143 Center Street
SAN JOSE.....16 N. First Street

MOST PRACTICAL and ECONOMICAL ARRANGEMENT for the MODERN EFFICIENT EQUIPMENT OF SCHOOL STAGES FURNISHED GRATIS

We have equipped 95% of those built in California

REFERENCES — Orpheum, Pantages or Empress Theatres, San Francisco. All Turner & Dahnken Houses. Theatres everywhere. Manual Arts High, Los Angeles. Chaffee Union High, Ontario. Santa Cruz High School. Bakersfield High School. And over one hundred others.

HIGHEST GRADE ARTISTIC WORKMANSHIP—CONTINUOUS HELPFUL SERVICE.

EDWIN H. FLAGG SCENIC CO. 1638 LONG BEACH AVE., LOS ANGELES
510 PANTAGES BLDG., SAN FRANCISCO

Thomas Elam Grover C. Elam

THOMAS ELAM & SON

GENERAL CONTRACTORS

Office, Builders' Exchange
180 Jessie Street

SAN FRANCISCO
Phone Sutter 6700

Phone Sutter 1533

FOSTER VOGT COMPANY

CONTRACTORS

411 Sharon Building SAN FRANCISCO

Pile Driving
Concrete Foundations
Fire Proofing
Building Construction

When writing to Advertisers please mention this magazine.

STOCKHOLM & ALLYN
GENERAL CONTRACTORS
Telephone Douglas 4657 — Monadnock Building, San Francisco

A. KNOWLES — R. H. MATHEWSON
KNOWLES & MATHEWSON
CONTRACTORS AND ENGINEERS
Fireproof and Reinforced Concrete Construction
442 Call Bldg., San Francisco, Cal.
Phone Sutter 4712

GRAVEL-ROCK Quick Service any point in the San Joaquin Valley, Calif.
GRANT ROCK AND GRAVEL COMPANY
327-328 Cory Building — FRESNO, CALIF.

GEO. FARRELL, BURLINGAME
Res. Phone Burlingame 1045
W. N. REED, 239 PRECITA AVE.
Res. Phone Valencia 6020
FARRELL & REED
CONTRACTORS
PHONE SUTTER 450
9th FLOOR GUNST BLDG.
709 MISSION STREET, Cor. 3rd
SAN FRANCISCO, CALIF.

MILLER-ENWRIGHT CO.
SACRAMENTO, CAL.
PLUMBING SUPPLIES
STEAM and PIPE FITTINGS, VALVES, Etc.
PIPE—ALL KINDS
STEAM AND HOT WATER BOILERS
PENINSULAR HOT AIR FURNACES
Catalogues on Application

The U. S. Government insists upon Good Screening—
Why not you? WATSON METAL SCREENS are specified in Federal Contracts.
Write for Samples, Specifications and Circulars.
RICHARD SPENCER, California Agent
Phone Kearny 2915 — 801-803 Hearst Building, SAN FRANCISCO

A. LETTICH
365 FELL ST., SAN FRANCISCO
Telephone — Park 234
Plumbing

C. D. VEZEY — O. G. LAWTON
LAWTON & VEZEY
BUILDING CONSTRUCTION
PHONE LAKESIDE 91 — 206 PLAZA BUILDING, OAKLAND

When writing to Advertisers please mention this magazine.

CITY OF PARIS
Decorative Studios
GEARY AND STOCKTON STS. SAN FRANCISCO

Capital $1,000,000 CALIFORNIA DEPARTMENT Surplus $4,014,186.62
THE FIDELITY AND CASUALTY COMPANY OF NEW YORK
Prompt Service for
BONDS AND CASUALTY INSURANCE
203-206 Merchants Exchange Building SAN FRANCISCO, CAL.

ANY PLACE ANY TIME PROMPTLY "We Serve You"
ROBERTSON & HALL
GENERAL INSURANCE
Phone Sutter 2750 First National Bank Building, San Francisco

INSURANCE SURETY BONDS
J. T. COSTELLO CO.
INSURANCE BROKERS
216 Pine Street, San Francisco Phone Sutter 188

Telephone Sutter 5231 Member Insurance Brokers' Exchange
FRED H. BOGGS
INSURANCE
Foxcroft Building, 68 Post Street SAN FRANCISCO

CONTRACT BONDS
Fidelity and Surety Bonds of every kind.
C. K. BENNETT, Manager
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
Telephone Kearny 1452 701 Insurance Exchange, San Francisco, Calif.

PACIFIC DEPARTMENT
Globe Indemnity Company
BONDS and CASUALTY INSURANCE for CONTRACTORS
120 Leidesdorff Street Phone Sutter 2280 SAN FRANCISCO

CONCRETE ENGINEERING CO.
MEYER SYSTEM METAL FORMS FOR CONCRETE FLOORS
433 Rialto Building, San Francisco. Home Office, Omaha

Phone Kearny 3526

A. H. Bergstrom
Eric Lange

LANGE & BERGSTROM
BUILDING CONTRACTORS
(ESTABLISHED 1900)

207-210 Sharon Bldg. San Francisco

Phone Market 776

WILLIAMS BROS. & HENDERSON

E. F. Henderson *Chas. Williams*

BUILDING CONTRACTORS

381 TENTH STREET *SAN FRANCISCO*

Member Builders' Exchange
180 Jessie Street
Telephone Sutter 6700

Residence 2909 California Street
Telephone Fillmore 1427

C. C. MOREHOUSE

Plain and Ornamental PLASTERING. Imitation STONE WORK of All Kinds
Exterior CEMENT PLASTERING. Metal FURRING and LATHING
MODELING and CASTING. STUCCO WORK

Office and Shop: 872 FOLSOM ST., San Francisco
TELEPHONE SUTTER 6509

ARTHUR ARLETT

BUILDING CONSTRUCTION

CALL BUILDING SAN FRANCISCO

When writing to Advertisers please mention this magazine.

MONSON BROS.

Phone Market 2693

CONTRACTORS and BUILDERS

502 Clunie Building SAN FRANCISCO Shop, 1907 Bryant St.

Phone KEARNY 3021

GEORGE A. BOS

GENERAL CONTRACTOR
CONSULTING ENGINEER

HEARST BUILDING
SAN FRANCISCO

P. A. Palmer Peter Petersen W. L. Kelley O. G. Hoaas

PALMER & PETERSEN

Contracting Engineers

774-776 Monadnock Building SAN FRANCISCO, CAL.

Residence 2887 GREEN STREET Res. Phone, West 9451 Office Phone, Sutter 3580

P. MONTAGUE CO.

TEAMING AND GRADING

Office: General Contractors' Assn. 110 Jessie Street, San Francisco

C. L. WOLD Office Phone Sutter 4971 JOSEPH DUNN

C. L. WOLD COMPANY

GENERAL CONTRACTORS

75 SUTTER STREET, Cor. Montgomery, SAN FRANCISCO

GENERAL CONTRACTORS ASSOCIATION Phone Sutter 3580

HOUGHTON CONSTRUCTION CO.

Successor to
VAN SANT, HOUGHTON & CO.

Engineering and Construction

Offices, Flatiron Bldg., San Francisco Century Bldg., Denver

J. D. HANNAH

Contractor and Builder

OFFICE: 725 Chronicle Building
San Francisco, Cal.

Telephone Douglas 3895
BUILDERS EXCHANGE, 180 JESSIE STREET

D. ZELINSKY & SONS

INCORPORATED

PAINTERS AND DECORATORS

420 TURK STREET, SAN FRANCISCO

UNITED STATES STEEL PRODUCTS CO.

Rialto Building, San Francisco

SELLERS of the products of the American Bridge Co., American Sheet and Tin Plate Co., American Steel and Wire Co., Carnegie Steel Co., Illinois Steel Co., National Tube Co., Lorain Steel Co., Shelby Steel Tube Co., Tennessee Coal, Iron and Railroad Co., Trenton Iron Co.

MANUFACTURERS OF

Structural Steel for Every Purpose — Bridges, Railway and Highway — "Triangle Mesh" Wire Concrete Reinforcement — Plain and Twisted Reinforcing Bars — Plates, Shapes and Sheets of Every Description — Rails, Splice Bars, Bolts, Nuts, etc. — Wrought Pipe, Valves, Fittings, Trolley Poles — Frogs, Switches and Crossings for Steam Railway and Street Railway — "Shelby" Seamless Boiler Tubes and Mechanical Tubing—"Americore" and "Globe" Rubber Covered Wire and Cables — "Reliance" Weatherproof Copper and Iron Line Wire—"American" Wire Rope, Rail Bonds, Springs, Woven Wire Fencing and Poultry Netting — Tramways, etc.

United States Steel Products Co.

OFFICES AND WAREHOUSES AT

San Francisco - Los Angeles - Portland - Seattle

HERMAN T. LUDWIG
Building Construction
Phone Valencia 2539 636 Jessie Street, Near 7th, San Francisco

GEO. W. BOXTON & SON
General Contractors
Office, 1233 HEARST BUILDING SAN FRANCISCO, CAL.
Telephone Sutter 1601

Phone Kearny 381 J. M. Morrison F. H. Masow
MASOW & MORRISON
GENERAL CONTRACTORS
BUILDING CONSTRUCTION
518-522 Monadnock Bldg. San Francisco

Res. Mill Valley, Telephone Mill Valley 240 Member of General Contractors Association
HARVEY A. KLYCE
GENERAL BUILDING CONTRACTOR
408 New Call Building, SAN FRANCISCO Phone Douglas 3280

"LENNIG SYSTEM"
ELECTRIC HEATING RADIATOR with Automatic Temperature Control
The THERMOSTAT and THERMOPILE are only sold to Manufacturers and the Trade. Not at retail and not to be installed by this company.
Contractors and Dealers in Plumbing and Heating Goods—Ask for detailed information. Our proposition will interest you.
THERMIC ENGINEERING COMPANY *CLAUS SPRECKELS BUILDING, SAN FRANCISCO*

MacRORIE-McLAREN CO.
LANDSCAPE ENGINEERS and GENERAL NURSERYMEN
Office, 141 POWELL STREET, San Francisco
Nurseries at Beresford, San Mateo County

Phone Sutter 2581
LARSEN-SAMPSON CO.
BUILDING CONSTRUCTION
601 CROCKER BUILDING SAN FRANCISCO

Phone Garfield 2444
FRANK STEVENSON
PLASTERING CONTRACTOR
42 Sherwood Building 320 Market St. San Francisco

What Enamel Do You Specify?

Every architect pays particular attention to the quality of the finish produced with the enamel he has specified. For that reason he will specify only an enamel in which he has confidence and which he knows is dependable and durable.

Silkenwhite Enamel

is the choice of many of the foremost architects in the West; — this is to be expected since an architect who specifies it is assured of an enamel finish to which he may point with pride for years to come.

MANUFACTURED BY

W. P. Fuller & Co.

Specialized Paint and Varnish Products For Every Purpose

be
ARCHITECT & ENGINEER
of California
eptember 1917
ol. I-No. 3
25¢ a Cop
$1.50 a Yea
BLISHED IN SAN FRANCISCO

"Pacific" Installation Chevrolet Motor Co., Oakland H. G. Newman, Plumber

"Pacific" Plumbing Fixtures are installed in factories and public service buildings, because of their uniform high quality.

A few school installations are:

Polytechnic High School,	San Francisco	Melrose Heights School,	Oakland	Chowchilla School	
Washington Irving School	" "	Stonehurst School	"	Palo Alto High School	
Oriental School	" "	Piedmont School	"	Oroville High School	
Washington Grammar School	" "	La ayette School	"	Redding High School	
John Swett School	" "	Prescott School	"	Coalinga High School	
Paul Revere School	" "	Highland School	"	Merced High School	
Lowell High Shool	" "	Claremont Annex School	"	Placerville High School	
Oakland Technical High School,	Oakland	Cole School	"	Elko School	
Durant School	"	Lazear School	"	Peres School	
Lockwood School	"	Lake View School	"	Yosemite Grammar School	

Lodi Grammar School, Lodi, Cal. Stone & Wright, Architects.
Hauser Reversible Windows specified and used.

HAUSER WINDOWS embody all the latest ideas and improvements in Casement, Vertical Hung and Double Acting Windows. They are water-tight, dust-proof and most easily operated. The U. S. District Court recently decided that the **HAUSER REVERSIBLE WINDOW** is in a class by itself.

HAUSER REVERSIBLE WINDOW COMPANY

Phone Kearny 3700 157 Minna St. San Francisco

For Modern Store-Fronts

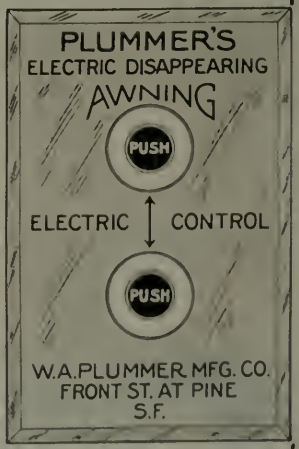
Our Disappearing AWNINGS

are constructed with no outside attachments below recess, above windows gears entirely concealed.

Absolutely practicable when extended and when rolled up is contained in recess 8" x 8 1/2", with front board, which can be utilized as a sign board, covering front of recess. Operated either by crank or electric control, from any part of building.

Send for Architect's Sheet of Specifications.

The new Southern Pacific Building, San Francisco, is being equipped with **Plummer's Disappearing Awnings**



L. P. Hobart, Architect
Clinton Construction Co., General Contractors

The Pacific Coast Shredded Wheat Company
OAKLAND, CALIFORNIA

Every modern factory is an advertisement for Fenestra Solid Steel Windows

Ask for our Stock Sash Folder

Detroit Steel Products Co.
DEPARTMENT A20, DETROIT, MICH.

Fenestra
SOLID STEEL WINDOWS

THE PERFECTION DISAPPEARING BEDS

The Last Word in Efficiency, Simplicity and Adaptability

Full Line of Oscillating Beds, Disappearing Beds, Recess Beds, Wall Beds

PERFECTION DISAPPEARING BED CO.

Telephone Sutter 3367

739 Mission Street, San Francisco

THE HYLOPLATE BLACKBOARD

SCHOOL FURNITURE
Auditorium Seating

MAPS
GLOBES
ATLASES

C. F. WEBER & CO.

365 Market Street
SAN FRANCISCO

222-224
S. Los Angeles St.
LOS ANGELES

100 W. Commercial
Row, RENO, NEV.

124 W. Washington
Street, PHOENIX, ARIZ.

KEYHOLD LATH

(Made in California)

A GYPSUM and magnesite plaster board with the perfect mechanical key, complying with the ordinance in building laws—non-conductor of sound, heat and electricity. Saves in time and expense over metal lath construction. We give specifications, demonstrations and figure partitions, ceilings and wall furring, in class "A," "B" and "C" buildings, and exterior stucco jobs, furnishing the only plaster-board known in lengths up to 12 feet, eliminating horizontal joints.

See our display at Building Material Exhibit, 77 O'Farrell street, showing Keyhold Lath "Standard," "Fireproofed," "Waterproofed" and "Wall Board."

KEYHOLD LATH COMPANY

Manufacturer's Distributors for
SCHUMACHER WALL BOARD COMPANY
251-255 Monadnock Building, San Francisco. 'Phone Douglas 3472.

Mueller Self-Closing Basin Cocks

The patented construction here shown positively prevents leakage and waste—an item of the utmost importance in all buildings—residences, clubs, hotels and office buildings.

Mueller Self-Closing Faucets are made from superior metal, by skilled workmen, in the foremost brass goods factory, and are guaranteed to give lasting service and thoro satisfaction, at the lowest cost of upkeep.

Made in a variety of patterns, to meet every requirement these goods have long been recognized as the true standard of excellence—in quality, in efficiency and in economy.

Detailed information and prices on request.

H. MUELLER MFG. COMPANY, Decatur, Illinois

Phone: Bell 153—Auto. 2131

Water, Plumbing and Gas Brass Goods

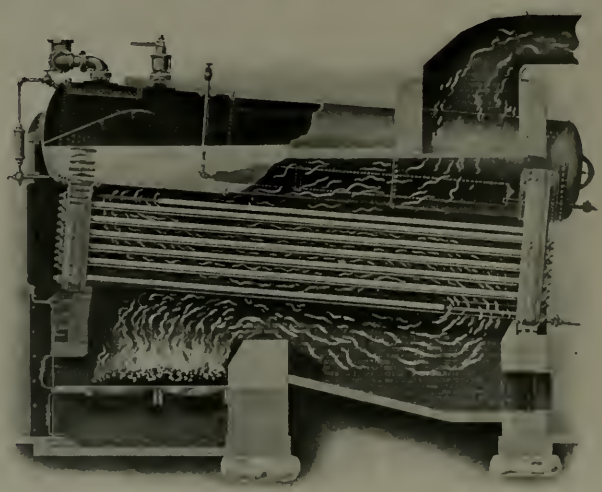
New York City, 145 W. 30th St.
Phone, Madison Square 5397

San Francisco, 589 Mission St.
Phone, Sutter 3577

© 1917 H M Co

The FRANKLIN Water-Tube Boiler

COMPLYING WITH THE CALIFORNIA CODE



DESCRIPTION

Your Attention Invited

Safety Under High Pressure through proper choice of materials.

Unimpeded Circulation through correct design.

High Furnace Temperature, resulting in complete combustion.

Heating Surface properly disposed to absorb heat.

Easy Cleaning and Inspection from outside front and rear.

Hand-Hole Plate Joints tightened by internal pressure.

Method of Support, ideal for contraction and expansion.

Many Other Meritorious Features

INSTALLATIONS

YOUR INSPECTION INVITED

Y. M. C. A. Building, S. F.	3—104 H.P.	312 H.P.
St. Luke's Hospital, S.F.	2—150 H.P.	300 H.P.
St. Mary's Hospital, S. F.	2—135 H.P.	270 H.P.
University of Cal. Hospital, S. F.	2—165 H.P.	330 H.P.
Examiner Building, S. F.	2—119 H.P.	238 H.P.
Whitney Building, S. F.	2—143 H.P.	286 H.P.
Hotel Del Monte, Monterey	1—220 H.P.	220 H.P.
Shattuck Hotel, Berkeley	2— 90 H.P.	180 H.P.
Cal. Paper & Bd. Mills, Antioch	2—270 H.P.	540 H.P.
Cal. Paper & Bd. Mills, Antioch	3—190 H.P.	570 H.P.
Western Meat Co., S. F.	2—104 H.P.	208 H.P.
Oakland Meat Co., Oakland	1—143 H.P.	143 H.P.
Belmont School, Belmont	1—104 H.P.	104 H.P.
St. Joseph's Home	2—104 H.P.	208 H.P.
D. Ghiradelli & Co., S. F.	1—152 H.P.	152 H.P.
Rialto Bldg., S. F.	1—135 H.P.	135 H.P.
Fairmont Hotel, S. F.	2—104 H.P.	208 H.P.
Total		4404 H.P.

Send for Catalog "E"

SELLING AGENTS

GENERAL MACHINERY & SUPPLY CO.

39-51 Stevenson Street, San Francisco, Cal.

Institute of Musical Art, New York.
Donn Barber, Architect. Deadened with Cabot's Quilt.

Make Your Floors and Partitions Sound-proof

by lining them with
the standard deadener

Cabot's "Quilt"

Every Hotel, Flat, Lodge, Hospital, School, Auditorium or similar building should be sound-proofed. If it isn't sound-proof it's a failure. Cabot's Quilt has made more buildings really sound-proof than all other deadening methods combined. Musical schools are the hardest buildings to deaden, and the N. E. Conservatory of Music, Canadian Conservatory of Music, N. Y. Institute of Musical Art, and many others show that Quilt is perfect. Sound-proof, rot-proof, vermin-proof and fire-retarding. Quilt is the only deadener that breaks up and absorbs the sound-waves. It is a thick, elastic cushion of dead-air spaces.

Send for sample and full catalog.

SAMUEL CABOT, Inc., Mfg. Chemists, Boston, Mass.

Cabot's Creosote Shingle Stains **Cabot's Stucco Stains**
Cabot's Waterproof Brick Stains, Plasterbond Damp-proofing

Pacific Building Materials Co., San Francisco **S. W. R. Daily, Seattle**
The Waterhouse Company, Los Angeles **Timms, Cress & Co., Portland**

COURTEOUS CONTINUOUS PACIFIC GAS AND ELECTRIC COMPANY RELIABLE

GAS IS THE CLEANEST AND

MOST EFFICIENT FUEL

A MATCH AND

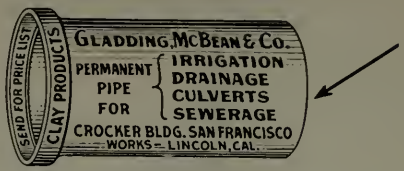
"PACIFIC SERVICE"

WILL GIVE YOU

CONTINUOUS SERVICE

Pacific Gas and Electric Company

San Francisco District
445 Sutter Street, San Francisco, Cal.



RAYMOND GRANITE COMPANY

Incorporated

Owning and operating at Knowles, Madera County, the largest Quarry in the world.

CONTRACTORS FOR STONE WORK

OF EVERY DESCRIPTION

Designers and Manufacturers of Exclusive Monuments and Mausoleums.

Main Office and Yard:

Number 1 and 3 Potrero Avenue, - SAN FRANCISCO, CALIFORNIA.

Also at Number 612-614 Homer Laughlin Building, Los Angeles.

QUALITY SAND & ROCK CO.

Successor to SARATOGA CRUSHED ROCK COMPANY
and BAKER-MACDONALD CO.

CONCRETE ROCK AND CLEAN SHARP SAND

Crushed, Washed and Screened and in any size desired

SPECIALLY PREPARED SELF-BINDING ROCK

LOW FREIGHT RATE TO POINTS ON PENINSULAR RAILWAY

400-CUNARD BLDG., SAN FRANCISCO
Phone Douglas 2748

Quarry: Saratoga, Santa Clara Co.

703 First National Bank Building, SAN JOSE. Phone S.J.4620

S. F. Metal Stamping Works

THEOPHILE LAHAYE

ORNAMENTAL and PLAIN
Stamped, Spun, Hammered and Cast METAL

2269 FOLSOM ST. Phone Mission 2421 SAN FRANCISCO

Architects' Specification Index

(For Index to Advertisements, see next page)

ACOUSTICAL CORRECTION
H. W. Johns-Manville Co., Second and Howard Sts., San Francisco.

ARCHITECTURAL SCULPTORS, MODELING, ETC.
G. Rognier & Co., 233 R. R. Ave., San Mateo.
A. F. Swoboda, modeler, 204 Second St., San Francisco.

ARCHITECTURAL TERRA COTTA
Gladding, McBean & Company, Crocker Bldg., San Francisco.

ASBESTOS ROOFING
H. W. Johns-Manville Company, San Francisco, Los Angeles, San Diego, Sacramento.
Asbestos Protected Metal Co., Hobart Bldg., San Francisco.

AUTOMATIC SPRINKLERS
Scott Company, 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

AWNINGS
W. A. Plummer Mfg. Co., Pine and Front Sts., San Francisco.

BANK FIXTURES AND INTERIORS
Fink & Schindler, 218 13th St., San Francisco.
A. J. Forbes & Son., 1530 Filbert St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco.
Home Mfg. Co., 543 Brannan St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.
Mullen Manufacturing Co., 20th and Harrison Sts., San Francisco.

BLACKBOARDS
C. F. Weber & Co., 365 Market St., San Francisco.
Beaver Blackboards and Greenboards, Rucker-Fuller Desk Company, Coast agents, 677 Mission St., San Francisco, Oakland and Los Angeles.

BLOCK PAVING
California Redwood Association, Call-Post Bldg., San Francisco.

BOOK BINDERS AND PRINTERS
Hicks-Judd Company, 51-65 First St., San Francisco.

BOILERS
"Franklin" water tube boiler, sold by General Machinery and Supply Co., 37 Stevenson St., San Francisco.
"Kewanee," boiler sold by California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.

BRASS GOODS, CASTINGS, ETC.
H. Mueller Manufacturing Co., 589 Mission St., San Francisco.

BRICK—PRESSED, PAVING, ETC.
Gladding, McBean & Company, Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Livermore Brick Company, pressed, glazed and enameled, etc., Livermore, Cal.
United Materials Co., Crossley Bldg., San Francisco.
California Brick Company, Niles, Cal.

BRICK AND CEMENT COATING
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.
Wadsworth, Howland & Co., Inc. (See Adv. for Pacific Coast Agents.)
Paraffine Paint Co., 34 First St., San Francisco.
R. N. Nason & Co., 151 Potrero Ave., San Francisco.

BRICK STAINS
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

BUILDERS' HARDWARE
Bennett Bros., agents for Sargent Hardware, 514 Market St., San Francisco.
Pacific Hardware & Steel Company, San Francisco, Oakland, Berkeley, and Los Angeles.

BUILDING MATERIAL, SUPPLIES, ETC.
Pacific Building Materials Co., 523 Market St., San Francisco.
C. Jorgensen, Crossley Bldg., San Francisco.
Richard Spencer, Hearst Bldg., San Francisco.
The Howard Company, First and Market Sts., Oakland.
James P. Dwan, 1113 Hearst Bldg., San Francisco.

CEMENT
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market street, San Francisco.
"Golden Gate" Brand, manufactured by Pacific Portland Cement Co., Pacific building, San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See distributing agents in advertisement.)
Armorite, sold by W. P. Fuller & Co., all principal Coast cities.
Imperial Waterproofing, manufactured by Imperial Co., Monadnock Bldg., San Francisco.
Paraffine Paint Co., 34 First St., San Francisco.

CEMENT EXTERIOR FINISH
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co., (See list of Distributing Agents in adv.)
Concreta, sold by W. P. Fuller & Co., all principal Coast cities.

"GRANT CONCRETE MIX" The only properly proportioned mix in this market. Composed of hard, clean, fresh-water gravel, free from sand stone, and contains about 25% of crushed rock and necessary amount of sand.

WE GUARANTEE LESS THAN 25% VOIDS.

Used on many important first-class buildings and road work. Accepted on all City, State and U. S. Government work.

GRANT GRAVEL COMPANY

PLATIRON BLDG., Phone Sutter 1582, SAN FRANCISCO

An Index to the Advertisements

	Page
American Art Metal Works	22
American Mail Chute	30
American Marble & Mosaic Co.	36
American Rolling Mill	125
American Standard Oil Burner	144
Arlett, Arthur	148
Asbestos Protected Metal Co.	117
Atlas Heating & Ventilating Co.	128
Austin Cube Mixer	141
Aylsworth Agencies Co	13
Bacon, Ed. R.	122
Baker-MacDonald Co.	6
Barrett & Hilp	128
Bass-Hueter Co.	3rd Cover
Bender Roofing Co.	128
Bennett Bros.	145
Bergren & Son, L. G.	123
Berry Bros.	139
Bigley, Albert S.	30
Biturine Company	30
Boggs, Fred H.	147
Bos, Geo. A.	149
Bowser & Co., S. F.	Insert B
Boxton & Son, Geo. W.	151
Brady, A. P.	146
Brininstool Co.	28-29
Brunswick-Balke-Collender Co.	Insert B
Building Material Exhibit	26
Burlington Venetian Blind Co.	34
Butte Engineering Co.	115
Buttonlath	20
Cabot, Samuel (Inc.)	5
California Artistic Metal and Wire Co.	32
California Brick Co.	19
California Bldg. Material Co.	141
California Glass Brick Co.	137
California Granite Co.	145
California Hydraulic Engineering and Supply Co.	123
California Photo Engraving Co.	144
California Plumbing Supply Co.	18
California Redwood Ass'n	126
California Seed Co.	11
Cannon-Phillips Co.	138
Capitol Sheet Metal Works	142
Carnahan & Mulford	145
Central Iron Works	32
Channing, John	129
Childs, Neil T.	124
City of Paris	147
Coleman, Alex	144
Commary, W. T.	142
Cook Belting Co.	141
Costello, J. T. Co.	147
Courtney, G. W.	123
Cowell Lime & Cement Co.	141
Crane Co.	31
Crowe, J. B.	123
Cutler Mail Chute Co.	30
Denison Block Co.	138
Detroit Steel Products	2
Dieckmann Hardwood Co.	120
Dolan Wrecking and Construction Co.	128
Dudfield Lumber Co.	15
Duncan, W. C.	144
Dunn, Neil H.	141
Dwan, Jos. P.	117
Dyer Bros.	22
Eaton, W. L.	143
Elam & Son	145
Ellery Arms Co.	134
Fair Manufacturing Company.	32
Falvy, A.	34
Farrell & Reed	146
Fess System Co.	34
Fick Bros.	136
Fidelity & Casualty Co. of N.Y.	147
Fidelity & Deposit Co of Maryland	147
Fink & Schindler Co., The	142
Fish Fuel System	136
Flagg, Edwin H., Scenic Co.	145
Forbes & Son	134
Foster Vogt Co.	145
Foxcroft Bldg.	24
Fuller, W. P. Co.	156
General Gas Light Co.	24
General Machinery & Supply Co.	4
Germanwood Floor Co.	123
Gerow, B. V.	129
Gilley-Schmid Co.	144
Gladding, McBean & Co.	6
Glauber Brass Mfg. Co.	18
Globe Indemnity Co.	147
Goffette Sales Ass'n	143
Goldberg, Bowen & Co.	140
Golden Gate Decorating Co.	134
Golden Gate Ornamental Iron Co.	32
Goodyear Rubber Co.	25
Goold & Johns	117
Grant Gravel Co.	7
Grant Rock & Gravel Co.	146
Haines, Jones & Cadbury	128
Hammond, M. E.	18
Hannah, J. D.	149
Hauser Reversible Window	1
Hicks-Judd Co.	136
Hillard, C. J., Co.	33
Hipolito Screen Co.	34
Holbrook, Merrill & Stetson	127
Home Mfg. Co.	145
Hooper Lumber Co.	35
Hoosier Cabinets	142
Houghton Construction Co.	149
Howard Company	123
Hughson & Merton Co.	144
Hunt, Robt. W. & Co.	122
Hunter & Hudson	133
Hurley Co., J. C.	142
Ideal Heating Co.	117
Illinois Engineering Co.	35
Imperial Waterproofing Co.	23
Improved Sanitary Fixture Co.	23
Jackson Sidewalk Lights	14
James & Drucker	133
Jarvis, T. P.	35
Johns-Manville Co.	23
Johnson Service Co.	135
Jorgensen, C.	117
Judson Mfg. Co.	31
Key-Hold Lath Co.	2
Kinnear Mfg. Co.	36
Kissel, I. R.	142
Klyce, Harvey A.	151
Knowles & Mathewson	146
Lachman Wall Bed Co.	16
Lange & Bergstrom	148
Larsen & Bro	128
Larsen, Sampson & Co.	151
Lawton & Vezey	146
Lettich, A.	146
Livermore Pire Brick Works	19
Los Angeles Pressed Brick Co.	Insert A
Ludwig, H. T.	151
MacGruer & Co.	142
Magner Bros.	134
Mark-Lally Co.	133
Masow & Morrison	151
Mangrum & Otter	138
Marshall & Stearns Co.	22
Master Builders	120
McClenahan, S. P.	148
McElhinney Tile Co.	12
McGilvray Stone Co.	133
MacRorie-McLaren Co.	151
Meese & Gottfried	124
Miller-Enwright Co.	146
Modern Appliance Co.	140
Monk, John	133
Monson Bros.	149
Montague, P.	149
Morehouse, C. C.	148
Mortenson Construction Co.	32
Mott Iron Works	18
Mullen Mfg. Co.	117
Mueller, H., Mfg. Co.	7
Municipal Engineering Co.	141
Musto Sons Keenan Co.	13
Nason, R. N. & Co.	12
Nathan, Dohrmann Co.	144
National Mill & Lumber Co.	17
National Surety Co.	134
Ne Page, McKenny Co.	117
Newbery Electric Co.	117
New York Belting Co.	130
Niles Sand Gravel & Rock Co.	36
Norris Co., L. A.	140
O'Hara & Livermore	113
Oak Flooring Service Bureau	25
Otis Elevator Co.	Back Cover
Pacific Building Materials Co.	31
Pacific Coast Paint Corp'n	140
Pacific Coast Steel Company	27
Pacific Fire Extinguisher Co.	115
Pacific Gas & Electric Co.	5
Pacific Hardware and Steel Co.	144
Pacific Imp. Co.	17
Pacific Mfg. Co.	145
Pacific Porcelain Ware Co.	2d Cover
Pacific Rolling Mills	33
Palm Iron Works	31
Palmer & Petersen	149
Paraffine Paint Co.	Back Cover
Perfection Disappearing Bed Co.	2
Patent Vulcanite Roofing Co.	14
Phillips, Chas. T.	124
Phoenix Sidewalk Light Co.	9
Pioneer Paper Co.	9
Pitcher Door Hanger	17
Pittsburg Water Heater	21
Plummer, W. A. Mfg. Co.	1
Pope & Talbot	138
Portland Lumber Co.	15
Prometheus Electric Co.	18
Quality Sand and Rock Co.	6
Ralston Iron Works	33
Ray, W. S. Mfg. Co. Inc.	27
Raymond Granite Co.	6
Reliance Ball-Bearing Door Hanger	Insert D
Rigney Tile Co.	134
Rix Compressed Air Co.	23
Roberts Mfg. Co.	115
Robertson & Hall	147
Rognier & Co.	24
Rucker-Fuller Desk Co.	129
S. F. Metal Stamping Works	6
S. F. Pioneer Varnish Wks.	3d Cover
Schaw-Batcher Co.	132
Scott Co.	128
Schreiber & Sons Co.	30
Schrader Iron Works	32
Sierra Electric Constr. Co.	35
Simonds Machinery Co.	134
Simpson & Stewart	34
Sloan Valve Co.	Insert C
Southern California Iron and Steel Co.	27
Southern Pacific Co.	132
Speocer Elevator Co.	11
Spencer, Richard	32
Spencer Turbine Cleaner	144
St. Francis Hotel	26
Standard Elec. Con. Co.	115
Standard Varnish Co.	139
Stevenson, Frank	151
Stockholm & Allyn	146
Strable Mfg. Co.	Insert D
Sunset Lumber Company	15
Thermic Eng. Co.	151
Tittle, H. S.	134
Tormey Co.	133
Trost, Robt.	128
Uhl Bros.	114
United Lumber Co.	15
United Materials Co.	Insert A
U. S. Metal Products Co.	30, 138
U. S. Steel Products Co.	150
Van Emon Elevator Co.	136
Van Fleet-Freese Co.	10
Vitrolite Construction Co.	21
Vermont Marble Co.	24
Wadsworth Howland	116
Ward, P. R.	123
Walter, D. N. & E. & Co.	10
Weber, C. P. & Co.	2, 20
West Coast Wire & Iron Works	32
Western Blind & Screen Co.	20
Western Iron Works	33
Western Pacific	132
Western Vacuum Supply Co.	129
Whitcomb Hotel	133
White Bros.	112
Wilson, W. F., Co.	142
Wold, C. L., Co.	149
Woods, Huddart & Gunn	27
Zelinsky, D. & Sons	149

Roofing?
Don't take chances on inferior material. Buy the old reliable **Pioneer**
SPECIPY AND INSIST ON "PIONEER ROOFING"
PIONEER PAPER CO., Manufacturers
506-507 Hearst Bldg., San Francisco
Telephone Kearny 3788

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CEMENT EXTERIOR FINISH—continued
Pacific Building Materials Co., 523 Market St.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents in adv.)
Fuller's Concrete Floor Enamel, made by W. P. Fuller & Co., San Francisco.

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CHURCH INTERIORS
Fink & Schindler, 218 13th St., San Francisco.

CHUTES—SPIRAL
Haslett Warehouse Co., 310 California St., San Francisco.

COLD STORAGE PLANTS
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

COMPOSITION FLOORING
Germanwood Floor Co., 1621 Eddy St., San Francisco.
"Vitrolite," Vitrolite Construction Co., 34 Davis St., San Francisco.

COMPRESSED AIR MACHINERY
General Machinery & Supply Co., 39 Stevenson St., San Francisco.

COMPRESSED AIR CLEANERS
Spencer Turbine Cleaner. Sold by Hughson & Merton, 530 Golden Gate Ave., San Francisco.
Western Vacuum Supply Co., 1125 Market St., San Francisco.

CONCRETE CONSTRUCTION
Clinton Construction Co., 140 Townsend street, San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Palmer & Petersen, Monadnock Bldg., San Francisco.

CONCRETE HARDNER
Master Builders Method, represented in San Francisco by C. Roman, Sharon Bldg.
Goffette Sales Association, 276 Monadnock Bldg., San Francisco.

CONCRETE MIXERS
Austin Improved Cube Mixer. J. H. Hansen & Co., California agents, 508 Balboa Bldg., San Francisco.
Foote Mixers. Sold by Edw. R. Bacon, 40 Natoma St., San Francisco.

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Twisted Bars. Sold by Woods, Huddart & Gunn, 444 Market St., San Francisco.
Clinton Welded Wire Fabric, L. A. Norris Co., 140 Townsend St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Southern California Iron and Steel Company, Fourth and Mateo Sts., Los Angeles.

CONCRETE REINFORCEMENT—Continued.
Triangle Mesh Fabric. Sales agents, Pacific Building Materials Co., 523 Market St., San Francisco.

CONCRETE SURFACING
"Concreta." Sold by W. P. Fuller & Co., San Francisco.
Wadsworth, Howland & Co.'s Bay State Brick and Cement Coating. Sold by Jas. Hambly & Sons, Pacific Bldg., San Francisco and Los Angeles.

CONTRACTOR'S BONDS
Bonding Company of America, Kohl Bldg., San Francisco.
Globe Indemnity Co., 120 Leidesdorff St., San Francisco.
Fred H. Boggs, Foxcroft Bldg., San Francisco.
National Surety Co. of N. Y., 105 Montgomery St., San Francisco.
Fidelity & Casualty Co. of New York, Merchants Exchange Bldg., San Francisco.
Fidelity & Deposit Co. of Maryland., Insurance Exchange, San Francisco.
J. T. Costello Co., 216 Pine St., San Francisco.
Robertson & Hall, First National Bank Bldg., San Francisco.

CONTRACTORS, GENERAL
Arthur Arlett, New Call Bldg., San Francisco.
Farrell & Reed, 183 Jessie St., San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Carnahan & Mulford, 45 Kearny St., San Francisco.
Houghton Construction Co., Flatiron Bldg., San Francisco.
Geo. H. Bos, Hearst Bldg., San Francisco.
Larsen, Sampson & Co., Crocker Bldg., San Francisco.
J. D. Hannah, 725 Chronicle Bldg., San Francisco.
Stockholm & Allyn, Monadnock Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
L. G. Bergren & Son, Call Bldg., San Francisco.
Grace & Bernieri, Claus Spreckels Bldg., San Francisco.
Geo. W. Boxton & Son, Hearst Bldg., San Francisco.
W. C. Duncan & Co., 526 Sharon Bldg., San Francisco.
A. P. Brady, Humboldt Bank Bldg., San Francisco.
Harvey A. Klyce, New Call Bldg., San Francisco.
Knowles & Mathewson, Call Bldg., San Francisco.
C. L. Wold Co., 75 Sutter St., San Francisco.
P. R. Ward, 981 Guerrero St., San Francisco.
Lange & Bergstrom, Sharon Bldg., San Francisco.
T. B. Goodwin, 110 Jessie St., San Francisco.
Thos. Elam & Son, Builders Exchange, San Francisco.
Masow & Morrison, 518 Monadnock Bldg., San Francisco.
Lawton & Vezey, 306 Plaza Bldg., Oakland

PHŒNIX SIDEWALK LIGHTS
ARE INSTALLED at the Santa Fe Building,
Second and Market Streets, San Francisco
PHŒNIX SIDEWALK LIGHT CO.
472 Monadnock Building, SAN FRANCISCO
Telephone Douglas 3111

MAS-OLEUM FLOORING (A Mastic Linoleum)
DUSTLESS, SEAMLESS, WATERPROOF, ACID and ALKALI PROOF
VAN FLEET - FREEAR COMPANY, Agents
Telephone Douglas 1227 120 JESSIE STREET, SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONTRACTORS, GENERAL—Continued
Monson Bros., 502 Clunie Bldg., San Francisco.
Palmer & Peterson, Monadnock Bldg., San Francisco.
Robert Trost, Twenty-sixth and Howard Sts., San Francisco.
John Monk, Sheldon Bldg., San Francisco.

CONVEYING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CORK TILING, FLOORING, ETC.
Be-ver Cork Tile. Sold by W. L. Eaton & Co., 812 Santa Marina Bldg., San Francisco.
Van Fleet-Freear Company, 120 Jessie St., San Francisco.

CORNER BEAD
Capitol Art Metal Works, 1927 Market St., San Francisco.
United States Metal Products Co., 555 Tenth St., San Francisco; 750 Keller St., San Francisco.

CORK TILE AND INSULATION
Van Fleet-Freear Co., 120 Jessie St., San Francisco.

CRUSHED ROCK
Grant Gravel Co., Flatiron Bldg., San Francisco.
California Building Material Company, new Call Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., San Francisco.
Quality Sand & Rock Co., 400 Cunard Bldg., San Francisco.

DAMP-PROOFING COMPOUND
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Biturine Co., 24 California St., San Francisco.
Imperial Co., Monadnock Bldg., San Francisco.
"Pabco" Damp-Proofing Compound, sold by Paraffine Paint Co., 34 First St., San Francisco.
Wadsworth, Howland & Co., Inc., 84 Washington St., Boston. (See Adv. for Coast agencies.)

DOOR HANGERS
McCabe Hanger Mfg. Co., New York, N. Y.
Pitcher Hanger, sold by National Lumber Co., 326 Market St., San Francisco.
Reliance Hanger, sold by Sartorius Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Columbia Wire & Iron Works, Portland, Ore.

DRAIN BOARDS, SINK BACKS, ETC.
Germanwood Floor Co., 1621 Eddy St., San Francisco.

DRINKING FOUNTAINS
Haws Sanitary Fountain, 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.

DRINKING FOUNTAINS—Continued
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 173 Beale St., San Francisco.
M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELECTRICAL CONTRACTORS
Butte Engineering Co., 683 Howard St., San Francisco.
Goold & Johns, 113 S. California St., Stockton, Cal.
NePage, McKenny Co., 149 New Montgomery St., San Francisco.
Newbery Electrical Co., 413 Lick Bldg., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
H. S. Tittle, 245 Minna St., San Francisco.
Standard Electrical Construction Company, 60 Natoma St., San Francisco.

ELECTRICAL ENGINEERS
Chas. T. Phillips, Pacific Bldg., San Francisco.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 126 Beale St., San Francisco.
Van Emon Elevator Co., 54 Natoma St., San Francisco.

ENGINEERS
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

FIRE ESCAPES
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE EXTINGUISHERS
Scott Company, 243 Minna St., San Francisco
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

FIREPROOFING AND PARTITIONS
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

FIXTURES—BANK, OFFICE, STORE, ETC.
T. H. Meek & Co., 1130 Mission St., San Francisco.
Mullen Manufacturing Co., 20th and Harrison Sts., San Francisco.
The Fink & Schindler Co., 218 13th St., San Francisco.
A. J. Forbes & Son, 1530 Filbert St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

D. N. & E. WALTER & CO.
"SINCE 1858"
LINOLEUMS—CARPETS LARGE STOCKS CARRIED
Estimates furnished on request
100 STOCKTON STREET SAN FRANCISCO

Time for Planting is close at hand. Lay out your Country Place with the best the market affords in

TREES ∴ SEEDS ∴ BULBS

CALIFORNIA SEED COMPANY

AL. J. NEVRAUMONT, Manager
Phone Douglas 5895

151 Market Street, San Francisco

ARCHITECTS' SPECIFICATION INDEX—*Continued*

FLOOR TILE
New York Belting and Packing Company, 519 Mission St., San Francisco.
W. L. Eaton & Co., 112 Market St., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
R. N. Nason & Co., San Francisco and Los Angeles.

FLOORS—COMPOSITION
"Vitrolite," for any structure, room or bath. Vitrolite Construction Co., 1490 Mission St., San Francisco.
Germanwood Floor Co., 1621 Eddy St., San Francisco.

FLOORS—HARDWOOD
Oak Flooring Bureau, Conway Bldg., Chicago, Ill.
Strable Mfg. Co., 511 First St., Oakland.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.

FURNACES—WARM AIR
Miller-Enwright Co., 907 Front St., Sacramento.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co., 612 Howard St., San Francisco.
Rix Compressed Air and Drill Company, First and Howard Sts., San Francisco.

GARBAGE CHUTES
Bradshaw Sanitary Garbage Chute, Aylsworth Agencies Co., 591 Mission St., San Francisco, sole agents for California.

GAS GRATES
General Gas Light Co., 768 Mission St., San Francisco.

GLASS
W. P. Fuller & Company, all principal Coast cities.
Whittier, Coburn Co., Howard and Beale Sts., San Francisco.

GLASS BRICK
California Glass Brick Co., 228 Grant Ave., San Francisco.

GRADING, WRECKING, ETC.
P. Montague Co., 110 Jessie St., San Francisco.
Dolan Wrecking & Construction Co., 1607 Market St., San Francisco

GRANITE
California Granite Co., Sharon Bldg., San Francisco.
McGilvray-Raymond Granite Co., 634 Townsend St., San Francisco.
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.

GRAVEL AND SAND
California Building Material Co., new Call Bldg., San Francisco.
Del Monte White Sand, sold by Pacific Improvement Co., Crocker Bldg., San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
Grant Rock & Gravel Co., Cory Bldg., Fresno.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., 704 Market St., San Francisco.
Quality Sand & Rock Co., 400 Cunard Bldg., San Francisco.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.
Empire Plaster sold by Pacific Portland Cement Co., Pacific Bldg., San Francisco.

HARDWARE
Pacific Hardware & Steel Company, representing Lockwood Hardware Co., San Francisco.
Sargent's Hardware, sold by Bennett Bros., 514 Market St., San Francisco.

HARDWOOD LUMBER—FLOORING, ETC.
Dieckmann Hardwood Co., Beach and Taylor Sts., San Francisco.
Parrott & Co., 320 California St., San Francisco.
White Bros., cor. Fifth and Brannan Sts., San Francisco.
Strable Mfg. Co., 511 First St., Oakland.

HEATERS—AUTOMATIC
Pittsburg Water Heater Co., 478 Sutter St., San Francisco.

HEATING AND VENTILATING
Gilley-Schmid Company, 198 Otis St., San Francisco.
Mangrum & Otter, Inc., 507 Mission St., San Francisco.
Charles T. Phillips, Pacific Bldg., San Francisco.
James & Drucker, 450 Hayes St., San Francisco.
J. C. Hurley Co., 509 Sixth St., San Francisco.
Illinois Engineering Co., 563 Pacific Bldg., San Francisco.
Neil H. Dunn, 786 Ellis St., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
Scott Company, 243 Minna St., San Francisco.

HEAT REGULATION
Johnson Service Company, 149 Fifth St., San Francisco.

HOLLOW BLOCKS
Denison Hollow Interlocking Blocks. Cannon Phillips Co., Forum Bldg., Sacramento, and the Howard Company, Oakland.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

MADE IN SAN FRANCISCO

PASSENGER and FREIGHT ELEVATORS

INVESTIGATE OUR PRODUCT

SPENCER ELEVATOR COMPANY

126-128 Beale Street, SAN FRANCISCO Phone Kearny 664

McELHINNEY TILE CO.

Contractors for

FLOOR, WALL AND MANTEL TILE

1097 Mission Street, San Francisco Park 6986

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HOSPITAL EQUIPMENT
Sierra Electric Construction Company, 619 Call Bldg., San Francisco.

HOSPITAL FIXTURES
J. L. Mott Iron Works, 135 Kearny St., San Francisco.

HOTELS
St. Francis Hotel, Union Square, San Francisco
Hotel Whitcomb, facing Civic Center, San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and Monadnock Bldg., San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INTERIOR DECORATORS
Albert S. Bigley, 344 Geary St., San Francisco.
City of Paris, Geary and Stockton Sts., San Francisco.
A. Falvy, 578 Sutter St., San Francisco.
The Tormey Co., 1042 Larkin St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
O'Hara & Livermore, Sutter St., San Francisco.

KITCHEN CABINETS
Hoosier Cabinets, branch 1067 Market St., San Francisco.

LANDSCAPE ARCHITECTS
Neil T. Childs Co., 68 Post St., San Francisco.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 135 Kearny St., San Francisco.
Ralston Iron Works, 20th and Indiana Sts., San Francisco.

LANDSCAPE GARDENERS
MacRorie-McLaren Co., 141 Powell St., San Francisco.

LATHING MATERIAL
"Buttonlath," manufactured by Buttonlath Mfg. Co., office, Building Material Exhibit, San Francisco.
Keyhold Lath Co., 251 Monadnock Bldg., San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co., 445 Sutter St., San Francisco.
The Fish Fuel System, 50 Eighth St., San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
D. N. & E. Walter & Co., O'Farrell and Stockton Sts., San Francisco.

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.

LUMBER—Continued
Hooper Lumber Co., Seventeenth and Illinois Sts., San Francisco.
Portland Lumber Co., 16 California St., San Francisco.
Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
Pope & Talbot, foot of Third St., San Francisco.
Sunset Lumber Co., Oakland, Cal.
United Lumber Company, 687 Market St., San Francisco.
California Redwood Association, 723 Call-Post Bldg., San Francisco.

MAIL CHUTES
Cutler Mail Chute Co., Rochester, N. Y. (See adv. on page 30 for Coast representatives.)
American Mailing Device Corp., represented on Pacific Coast by U. S. Metal Products Co., 555 Tenth St., San Francisco.

MANTELS
Mangrum & Otter, 561 Mission St., San Francisco.

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.

METAL CEILINGS
San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

METAL DOORS AND WINDOWS
U. S. Metal Products Co., 555 Tenth St., San Francisco.
Capitol Art Metal Works, New Call Bldg., San Francisco. Factory in Richmond.

METAL FURNITURE
Capitol Art Metal Works, New Call Bldg., San Francisco. Factory in Richmond.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.

MILL WORK
Dudfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218 13th St., San Francisco.

OIL BURNERS
American Standard Oil Burner Company, Seventh and Cedar Sts., Oakland.
S. T. Johnson Co., 1337 Mission St., San Francisco.
T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., San Francisco.
Fess System, 220 Natoma St., San Francisco.
W. S. Ray Mfg. Co., 218 Market St., San Francisco.

NASON'S OPAQUE FLAT FINISH A FLAT, WASHABLE OIL PAINT, made in soft Kalsomine tints—a practical article for WALLS, CEILINGS, Etc. Economical and Durable. Agency TAMM & NOLAN COMPANY'S high grade Varnishes and Finishes, made on the Pacific Coast to stand our climatic conditions.

R. N. NASON & CO., Paint Makers
151 Potrero Ave.—SAN FRANCISCO—54 Pine Street
PORTLAND
SEATTLE
LOS ANGELES

CLARENCE E. MUSTO, Pres. JOSEPH B. KEENAN, Vice-Pres. GUIDO J. MUSTO, Sec'y & Treas.

JOSEPH MUSTO SONS-KEENAN CO.

Phone Franklin —6365— **MARBLE** OFFICE AND MILLS: 535-565 North Point St., SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE
- American Art Metal Works, 13 Grace St., San Francisco.
- California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
- Fair Manufacturing Company, 617 Bryant St., San Francisco.
- Palm Iron & Bridge Works, Sacramento.
- Ralston Iron Works, 20th and Indiana Sts., San Francisco.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
- Schreiber & Sons Co., represented by Western Builders Supply Co., San Francisco.
- Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
- West Coast Wire & Iron Works, 861-863 Howard St., San Francisco.

PAINT FOR CEMENT
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.) (See adv. in this issue for Pacific Coast agents.)
- Fuller's Concreta for Cement, made by W. P. Fuller & Co., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
- Berry Bros., 250-256 First St., San Francisco.
- Biturine Company, 24 California St., San Francisco.
- Pacific Coast Paint Corp'n, Security Bank Bldg., Oakland.
- Paraffine Paint Co., 34 First St., San Francisco.
- Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.

PAINTING, TINTING, ETC.
- Art Wall Paper Co., 508 Ellis St., San Francisco
- Golden Gate Decorating Co., 704 Polk St., San Francisco.
- I. R. Kissel, 1747 Sacramento St., San Francisco.
- D. Zelinsky & Sons, San Francisco and Los Angeles.
- The Tormey Co., 681 Geary St., San Francisco.
- Fick Bros., 475 Haight St., San Francisco.

PAINTS, OILS, ETC.
- The Brininstool Co., Los Angeles, the Haslett Warehouse, 310 California St., San Francisco.
- Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco.
- Berry Bros., 250-256 First St., San Francisco.
- Biturine Co., 24 California St., San Francisco
- Pacific Coast Paint Corp'n, Security Bank Bldg., Oakland.
- Magner Bros., 419-421 Jackson St., San Francisco.
- R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
- W. P. Fuller & Co., all principal Coast cities.
- Standard Varnish Works, 55 Stevenson St., San Francisco.

PANELS AND VENEER
- White Bros., Fifth and Brannan Sts., San Francisco.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA
- Gladding, McBean & Co., Crocker Bldg., San Francisco.

PLASTER CONTRACTORS
- C. C. Morehouse, Crocker Bldg., San Francisco.
- MacGruer & Co., 180 Jessie St., San Francisco.

PLASTER EXTERIORS
- Buttonlath, for exterior and interior plastering, Hearst Bldg., San Francisco.

PLUMBING CONTRACTORS
- Alex Coleman, 706 Ellis St., San Francisco.
- A. Lettich, 365 Fell St., San Francisco.
- Neil H. Dunn, 786 Ellis St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Scott Co., Inc., 243 Minna St., San Francisco.
- Wm. F. Wilson Co., 328 Mason St., San Francisco.

PLUMBING FIXTURES, MATERIALS, ETC.
- Crane Co., San Francisco and Oakland.
- California Steam Plumbing Supply Co., 671 Fifth St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Glauber Brass Manufacturing Company, 1107 Mission St., San Francisco.
- Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
- Improved Sanitary Fixture Co., 632 Metropolitan Bldg., Los Angeles.
- J. L. Mott Iron Works, D. H. Gulick, selling agent, 135 Kearny St., San Francisco.
- Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
- H. Mueller Manufacturing Co., Pacific Coast branch, 589 Mission St., San Francisco.
- Miller-Enwright Co., 907 Front St., Sacramento.
- Mark-Lally Co., 235 Second St., San Francisco, also Oakland, Fresno, San Jose and Stockton.
- Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
- Wm. F. Wilson Co., 328 Mason St., San Francisco.
- Neil H. Dunn, 786 Ellis St., San Francisco.

POTTERY
- Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

POWER TRANSMITTING MACHINERY
- Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PUMPS
- Simonds Machinery Co., 117 New Montgomery St., San Francisco.

RAILROADS
- Southern Pacific Company, Flood Bldg., San Francisco.
- Western Pacific Company, Mills Bldg., San Francisco.

REFRIGERATORS
- McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton Sts., San Francisco.

REVERSIBLE WINDOWS
- Hauser Reversible Window Company, Balboa Bldg., San Francisco.
- Whitney Windows, represented by Richard Spencer, 801-3 Hearst Bldg., San Francisco.

BRADSHAW
SANITARY GARBAGE CHUTE
For full particulars see
AYLSWORTH AGENCIES CO.
591 Mission St. San Francisco Tel., Douglas 4405

Jackson's Patent Sidewalk Lights and "No Leak" Sidewalk Doors
FIRST AND BEST
P. H. Jackson & Co. 237 - 247 FIRST ST., SAN FRANCISCO
Tel. Kearny 1959

ARCHITECTS' SPECIFICATION INDEX—*Continued*

REVOLVING DOORS
Van Kennel Doors, sold by U. S. Metal Products Co., 525 Market St., San Francisco.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
C. F. Weber & Co., 365 Market St., S. F.
Kinnear Steel Rolling Door Co., Rialto Bldg., San Francisco.
Wilson's Steel Rolling Doors, U. S. Metal Products Co., San Francisco and Los Angeles.

ROOFING AND ROOFING MATERIALS
Asbestos Protected Metal Company, Hobart Building, San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
H. W. Johns-Manville Co., Second and Howard Sts., San Francisco.
Niles Sand, Gravel and Rock Co., Mutual Bank Bldg., San Francisco.
"Malthoid" and "Ruberoid," manufactured by Paraffine Paint Co., San Francisco.
Pioneer Roofing, manufactured by Pioneer Paper Co., 513 Hearst Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.
Vulcanite Products—Vulcanite ornamental roofings and Vulcanite roofing shingles, sold by Patent Vulcanite Roofing Co., 16th and Texas Sts., San Francisco.

RUBBER TILING
Goodyear Rubber Company, 587 Market St., San Francisco.
New York Belting & Rubber Company, 519 Mission St., San Francisco.

SAFETY TREADS
"Sanitread," sold by Richard Spencer, 801-3 Hearst Bldg., San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.
C. Jorgensen, Crossley Bldg., San Francisco.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co., 365 Market St., San Francisco; 512 S. Broadway, Los Angeles.
Rucker-Fuller Desk Company, 677 Mission St., San Francisco.

SCREENS
Hipolito Flyout Screens, sold by Simpson & Stewart, Dalziel Bldg., Oakland.
Watson Metal Frame Screens, sold by Richard Spencer, 801-3 Hearst Bldg., San Francisco.

SEEDS
California Seed Company, 151 Market St., San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Paraffine Paint Co., 34 First St., San Francisco.

SHEET METAL WORK, SKYLIGHTS, ETC.
Asbestos Protected Metal Company, Hobart Bldg., San Francisco.
Capitol Sheet Metal Works, New Call Bldg., San Francisco. Works in Richmond.
U. S. Metal Products Co., 555 Tenth St., San Francisco.

SHINGLE STAINS
Cabot's Creosote Stains, sold by Pacific Building Materials Co., Underwood Bldg., San Francisco
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SIDEWALK LIGHTS
P. H. Jackson & Co., 237-47 First St., San Francisco.
Jas. P. Dwan, Hearst Bldg., San Francisco.
Phoenix Sidewalk Light Co., 472 Monadnock Bldg., San Francisco.

STEEL TANKS, PIPE, ETC.
Schaw-Batcher Co. Pipe Works, 356 Market St., San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Dyer Bros., 17th and Kansas Sts., San Francisco.
Golden Gate Iron Works, 1541 Howard St., San Francisco.
Judson Manufacturing Co., 819 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Southern California Iron and Steel Co., Fourth and Mateo Sts., Los Angeles.
Western Iron Works, 141 Beale St., San Francisco.

STEEL PRESERVATIVES
Bay State Steel Protective Coating, manufactured by Wadsworth, Howland Co. (See adv. for coast agencies.)
Paraffine Paint Co., 34 First St., San Francisco.
Biturine Company, 24 California St., San Francisco.

STEEL REINFORCING
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Southern California Iron & Steel Company, Fourth and Mateo Sts., Los Angeles; W. B. Kyle, San Francisco representative, Call Bldg.
Woods, Huddart & Gunn, 444 Market St., San Francisco.

STEEL ROLLING DOORS
Kinnear Steel Rolling Door Co., Rialto Bldg., San Francisco.

STEEL SASH
"Fenestra," solid steel sash, manufactured by Detroit Steel Products Company, Detroit, Mich.

STEEL WHEELBARROWS
Champion and California steel brands, made by Western Iron Works, 141 Beale St., San Francisco.

REGISTERED PREPARED VULCANITE ROOFINGS TRADE MARK
VULCANITE ROOFINGS
including
ROLLS, SHINGLES and ORNAMENTAL EFFECTS
PATENT VULCANITE ROOFING COMPANY
San Francisco Depot, 16th and Texas Sts. Phone Market 390

LATH, SHINGLES, SHAKES and POSTS, SASH, DOORS and MILL WORK
TIMBERS and SPECIALS KILN DRIED FINISH and FLOORING

SUNSET LUMBER COMPANY
DEALERS WHOLESALE AND RETAIL IN
PINE and REDWOOD LUMBER

PHONE OAKLAND 1820
YARDS AND OFFICE
OAK AND FIRST STS., OAKLAND, CAL.

PORTLAND LUMBER CO.

Yards { TRACY, CAL. BRENTWOOD, CAL.
Phone KEARNY 2074

PORTLAND LUMBER COMPANY
A. J. RUSSELL, Agent
LUMBER
SIMPLEX SILOS
SAGINAW SPECIAL SHINGLES
Ship Timbers, Oil Rigs and Special Bills Cut to Order.
16 California Street San Francisco, Cal.

Millwork Manufactured
and Delivered Anywhere
Plans or Lists sent us for Estimates will have Careful and Immediate Attention
DUDFIELD LUMBER CO.
Main Office, Yard and Planing Mill - PALO ALTO
JNO. DUDFIELD, President and Manager JOSEPH A. JURY, Secretary and Mill Supt.

Phone Kearny 2080
UNITED LUMBER MILLS
Pine and Redwood Lumber
WHOLESALE AND RETAIL—ESTIMATES GIVEN
687 MARKET STREET SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

STONE
California Granite Co., 518 Sharon Bldg., San Francisco.
McGilvray Stone Company, 634 Townsend St., San Francisco.

STORAGE SYSTEMS—GASOLINE, OIL, ETC.
S. F. Bowser & Co., 612 Howard St., San Francisco.
Rix Compressed Air and Drill Co., First and Howard Sts., San Francisco.

TELEPHONE AND ELECTRIC EQUIPMENT
Aylsworth Agencies Company, 591 Mission St., San Francisco.

TELEPHONE SIGNALS
Sierra Electric Construction Co., Call-Post Bldg., San Francisco.

TEMPERATURE REGULATION
Johnson Service Company, 149 Fifth St., San Francisco.

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market St., San Francisco.

TILES, MOSAICS, MANTELS, ETC.
Rigney Tile Company, Sheldon Bldg., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.
McElhinney Tile Co., 1097 Mission St., San Francisco.

TILE FOR ROOFING
Gladding, McBean & Co., Crocker Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

TILE WALLS—INTERLOCKING
Denison Hollow Interlocking Blocks, Forum Bldg., Sacramento.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

VACUUM CLEANERS
Palm Vacuum Cleaners, sold by Western Vacuum Supply Co., 1125 Market St., San Francisco.
Spencer Turbine Cleaner, sold by Hughson & Merton, 530 Golden Gate Ave., San Francisco.

VALVES
Sloan Royal Flush Valves. T. R. Burke, Pacific Coast agent, Wells Fargo Bldg., San Francisco.
Crane Radiator Valves., manufactured by Crane Co., Second and Brannan Sts., San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
Berry Bros., 250-256 First St., San Francisco.
W. P. Fuller Co., all principal Coast cities.
Pacific Coast Paint Corp'n, 112 Market St., San Francisco; Security Bank Bldg., Oakland.
R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
Standard Varnish Works, San Francisco.
S. F. Pioneer Varnish Works, 816 Mission St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
Burlington Venetian Blinds, Burlington, Vt., and C. F. Weber & Co., 365 Market St., San Francisco.
Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.

WALL BEDS, SEATS, ETC.
Lachman Wall Bed Co., 2019 Mission St., San Francisco.
Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.

WALL BEDS, SEATS, ETC.—Continued
Peck's Wall Beds, sold by Western Equipment Co., 72 Fremont St., San Francisco.
Perfection Disappearing Bed Co., 739 Mission St., San Francisco.

WALL BOARD
"Amiwud" Wall Board, manufactured by Paraffine Paint Co., 34 First St., San Francisco.

WALL PAINT
Nason's Opaque Flat Finish, manufactured by R. N. Nason & Co., San Francisco, Portland and Los Angeles.
San-A-Cote and Vel-va-Cote, manufactured by the Brininstool Co., Los Angeles.

WALL PAPER
Uhl Bros., 38 O'Farrell St., San Francisco.
The Tormey Co., 681 Geary St., San Francisco.
Art Wall Paper Co., 500 Ellis St., San Francisco.

WATER HEATERS—AUTOMATIC
Pittsburg Water Heater Co. of California, 478 Sutter St., San Francisco, and 402 Fifteenth St., Oakland.

WATERPROOFING FOR CONCRETE, BRICK, ETC.
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Biturine Company, 24 California St., San Francisco.
Goffette Sales Corporation, Monadnock Bldg., San Francisco.
H. W. Johns-Manville Co., San Francisco and principal Coast cities.
Imperial Co., 183 Stevenson St., San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Wadsworth, Howland & Co., Inc. (See adv. for Coast agencies.)

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL FINISH
"Gold Seal," manufactured and sold by Bass-Hueter Paint Company. All principal Coast cities.
"Silkenwhite," made by W. P. Fuller & Co., San Francisco.
"Satinette," Standard Varnish Works, 113 Front St., San Francisco.

WINDOWS—REVERSIBLE, CASEMENT, ETC.
Whitney Window, represented by Richard Spencer, Hearst Bldg., San Francisco.
Hauser Reversible Window Co., Balboa Bldg., San Francisco.
International Casement Co., represented by Edwin C. Dehn, Hearst Bldg., San Francisco.

WIRE FABRIC
U. S. Steel Products Co., Rialto Bldg., San Francisco.

WOOD MANTELS
Fink & Schindler, 218 13th St., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.

Lachman WALL BED CO.
2019 MISSION ST. NEAR 16TH
SAN FRANCISCO

The Most Up-to-Date WALL BEDS

Perfect Concealment
Economy of Space
Only 16" in depth required
Simple Installation
Most Inexpensive
Strong and Durable

Fan Shell Beach Sand

AND

Del Monte White Sand

A Wonderful Combination for a Perfect Stucco Finish. Try it.

Pacific Improvement Company

CROCKER BLDG.
San Francisco
Phone
Sutter
6130

Pitcher Door Hangers

HUMPHREY APARTMENTS, SAN FRANCISCO
C. A. MEUSSDORFFER, Architect
Equipped with PITCHER HANGERS.

Give Service Satisfaction

Are Dependable Durable and Economical

No extra thickness of wall required. Installed in 5½ inch partitions. Specify sliding doors in place of swinging doors.

Manufactured by

National Mill and Lumber Company

Kearny 3580 — 326 Market Street SAN FRANCISCO

MOTT PLUMBING FIXTURES

Architects and their clients are invited to visit our Showrooms, 135 Kearny St., San Francisco; D. H. GULICK, Sales Agent. Los Angeles Office, 1001 Central Building; J. R. MAYHEW, Sales Agent. Portland, Ore., Office, Sherlock Bldg.; F. J. KANE, Sales Agent. Seattle, Wash., Office, Securities Bldg.; P. C. WAACK, Sales Agent.

THE J. L. MOTT IRON WORKS
Established 1828

CALIFORNIA STEAM AND PLUMBING SUPPLY CO.

PIPE, VALVES AND FITTINGS
FOR
STEAM, GAS, WATER AND OIL

COMPLETE STOCK OF
The Kelly & Jones Company Products
WRITE FOR CATALOGUE

OFFICE AND WAREHOUSE:
671-679 FIFTH STREET
Corner Bluxome
SAN FRANCISCO, CALIFORNIA

Telephone Sutter 737

For Modern RESIDENCES *and* APARTMENTS

PROMETHEUS

The Electric Food and Plate Warmer

Tenants of high-class apartments regard Prometheus as a household necessity—as much so in keeping meals warm as the refrigerator in keeping food cold. Owners are installing Prometheus as an additional means of securing new and holding old tenants.

Prometheus keeps the meal steaming hot without injuring finest china. Wireless heating units of practically unlimited life, placed independent of shelves, are used exclusively.

THE PROMETHEUS ELECTRIC CO., Manufacturers
M. E. HAMMOND, 217 Humboldt Bank Building, San Francisco

SPECIFY GLAUBER FAUCETS

not only because they are GUARANTEED FIVE YEARS, but because of the QUALITY which enables us to guarantee them.

The Jury of Awards at the P. P. I. E. gave us **Seven Medals**, not because we indemnify our users against trouble with our goods, but because **Glauber Quality Faucets** don't cause trouble.

Three hundred of the best buildings on the Pacific Coast are equipped with **Glauber Cocks.**

Send for illustrated specification book.

Main Office and Factory
CLEVELAND, O.

Glauber Brass Mfg. Co.
567 Mission Street, San Francisco, Cal.

Eastern Branch
130 W. 32nd St.
NEW YORK

CALIFORNIA VITRIFIED BRICK

stands alone in its class among our Home Industries and is the best Paving Block made anywhere.

It is used on the streets of SAN FRANCISCO, OAKLAND, SAN JOSE, BERKELEY, SAUSALITO, LIVERMORE, SARATOGA, CALISTOGA and other California Cities.

Its use Insures Satisfactory and Permanent Pavements

INVESTIGATE NOW SAMPLES FURNISHED

California Brick Company

NILES, CALIFORNIA

Representatives at San Francisco and Oakland Exchanges

LIVERMORE PRESSED, MATT GLAZED AND ENAMELED BRICK

in a variety of colors including "Mottles," "Ruff," White, Ivory White, Cream, Grey, Green, Brown, Blue, etc., are designed to meet the requirements of Architects desiring permanent and unique effects.

Full size sample sent on request.

LARGE PRODUCTION—ATTRACTIVE PRICES—PROMPT DELIVERIES

Livermore Fire Brick Works

LIVERMORE, CALIFORNIA

Representatives at San Francisco and Oakland Exchanges

High School Building, San Diego

Union High School, Carruthers

Many of the Newest and Best Designed School Buildings on the Pacific Coast are Equipped with

WESTERN VENETIAN BLINDS

Manufactured by Western Blind & Screen Co., 2700 Long Beach Avenue, Los Angeles, California.

C. F. WEBER & CO., Agents

San Francisco Los Angeles Reno, Nev. Phoenix, Ariz.

BUTTONLATH SUSPENDED CEILING

SUSPENDED CEILINGS GIVE UNIFORM PLASTERING SURFACE, are rapid in erection and perfect **BUTTONLATH** non-conductors of sound. They also have striking advantage of low cost combined with severely tested capacity for fire resistance.

BUTTONLATH MANUFACTURING CO.

Boyle and Vernon Avenues
LOS ANGELES, CAL.

77 O'Farrell Street
SAN FRANCISCO, CAL.

FOR THE ARCHITECT

Who specifies a "PITTSBURG" Automatic Gas Water Heater — he is confident that his judgment will be commended.

FOR THE CUSTOMER

Who purchases a "PITTSBURG" Automatic Gas Water Heater — he is assured beyond a doubt of many years of satisfactory Hot Water Service.

PITTSBURG WATER HEATER COMPANY of California
478 Sutter St., San Francisco 402 15th St., Oakland

A Big Thing

New Model No. 65
"Pittsburg-Bungalow"
Automatic Water Heater,
Capacity three gallons
per minute.

VITROLITE
BETTER THAN MARBLE

VITROLITE

"BETTER THAN MARBLE"

installed throughout in wash basin cubbies, employees' kitchen, shelving, etc.

VITROLITE is a modern sanitary triumph. It is pure white in color, with a high light reflecting factor; can be made sterile with soap and water; is non porous; will not discolor; is impervious to the action of organic acids; is made in large slabs, and has a smooth surface with a beautiful lustre that will not deteriorate.

VITROLITE is invariably selected wherever beauty combined with the desire for easily preserved sanitation is requisite.

Let us send you catalogue and samples.

Vitrolite Construction Company

Standard Oil Building, San Francisco. Benj. G. McDougall, Architect

1490-92 Mission St.
SAN FRANCISCO
Tel. Market 109

Satisfaction

given a tenant or buyer means good will and good business in the future. Wherever our Oscillating Portal Wall Beds have been installed you will find they are giving absolute satisfaction to the tenants. The added use of the rooms and the saving in housework they offer, have won for them the favor of the housewives. They are recognized as a proven utility and as a point in favor of the house where they are installed.

MARSHALL & STEARNS CO.

WALL BEDS

1152 PHELAN BUILDING — SAN FRANCISCO
1774 BROADWAY — OAKLAND

GEO. H. DYER, President — R. W. DYER, Vice-Pres. — W. J. DYER, Sec'y

DYER BROTHERS

Golden West Iron Works, Inc.

Structural Iron and Steel Contractors

ORNAMENTAL IRON WORK

Office and works:
17th and KANSAS STREETS

SAN FRANCISCO, CAL.
Phone Market 134

United States Mint, San Francisco

All stone work on this building has been treated with

IMPERIAL WATER PROOFING

to prevent absorption and disintegration. The process leaves the stone in its natural color.

WE SPECIALIZE IN

WATER PROOFING PROBLEMS

Above Ground — Under Ground

IMPERIAL COMPANY

717-719 Monadnock Bldg.
SAN FRANCISCO

Johns-Manville Asbestos Roofing

NO more convincing testimonial for the life of Johns-Manville Asbestos Roofing exists than mother earth's own history. For ages asbestos has repelled the fiercest heats, the shock of quick cooling, and earth's corrosive agents. Unscathed after all these tests, it comes to you felted into sheets, ready to apply to your buildings—a natural roofing material whose inherent properties answer every requirement that you would include in specifying an ideal roofing.

No other roofing material has such a past behind it—no other roofing has such a future before it on your client's building.

Booklet sent free on Request

H. W. JOHNS-MANVILLE CO.
of California
2nd & Howard Sts., San Francisco
Los Angeles Sacramento San Diego

Stationary Outfit

To ARCHITECTS and ENGINEERS

The Public is tired of buying Gasoline by hidden measurement—All up-to-date equipments demand the VISIBLE Method of Supply.

DELANOY VISIBLE SYSTEM

Any station equipped with the visible apparatus will sell from 25 to 50 per cent more gasoline than by the ordinary method. Send for Circulars.

RIX COMPRESSED AIR & DRILL CO.
Sole Manufacturers
San Francisco Los Angeles

"THE BOUDOIR" (Reg. Trade Mark)
Pat. Dec 1913, Jan. 1915

Examine any bathroom, or any plan of a bathroom, with three separate fixtures set in any of the customary ways.

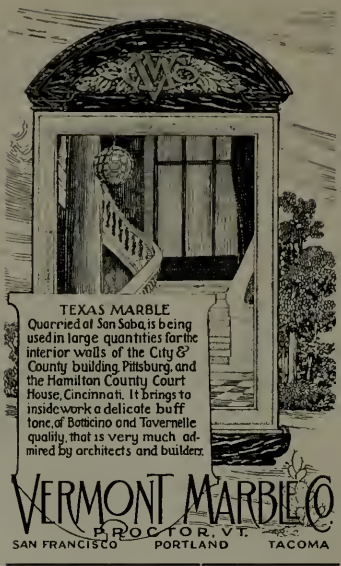
Cut out the separate lavatory, all its fittings, supply and waste pipes, trap, vent and connections. Sum up the cost of these, then

Substitute "THE BOUDOIR" Bath Fixture, with its large 20x24-in. h pedestal lavatory, accessibly placed, taking no space usable for any other purpose

Notice the improved appearance, additional room, the gained conveniences of a sitting shower, shampoo, washing in fresh running water, support in getting in and out of the bath tub, fewer fittings to polish and keep in order

Prompt deliveries anywhere from our nearest Factory.

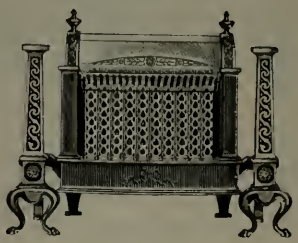
IMPROVED SANITARY FIXTURE COMPANY, 632 Metropolitan Bldg., Los Angeles, California, - U. S. A.



TEXAS MARBLE
Quarried at San Saba, is being used in large quantities for the interior walls of the City & County building, Pittsburg, and the Hamilton County Court House, Cincinnati. It brings to inside work a delicate buff tone, of Botticino and Tavernelle quality, that is very much admired by architects and builders.

VERMONT MARBLE CO.
PROCTOR, VT.
SAN FRANCISCO PORTLAND TACOMA

Imagine this Radiantfire
in *your* fireplace



All the charm of an open fire
No odor — No ashes
A Gas Heater that heats.

GENERAL GAS LIGHT CO.
C. B. BABCOCK, Mgr.
768 Mission St. San Francisco

House of Mrs. D. T. Murphy, Hillsborough, Cal.

LAWN AND GARDEN ORNAMENTS

Garden Furniture,
Flower Pots, Vases

Made by

G. Rognier & Co.
233 Railroad Ave., San Mateo, Cal.

FOXCROFT BUILDING, 68 Post Street, San Francisco. Offices Single and in Suite.

Beautiful Oak Floors

EVERYWHERE—WHY?

BECAUSE—

—Oak Flooring, by right of superior merit and conquest, is "America's Best Flooring."

—Women prefer Oak Flooring for the reason it is rich and cheerful in color, and offers unlimited possibilities to give the home that coveted touch of elegance.

—Oak Flooring is Distinctive, Beautiful and Substantial, three very vital reasons why so much Oak Flooring is in use today.

—Owners always demand Oak Flooring as they consider it a good investment. It attracts and satisfies buyers or tenants.

—Of all the hardwood flooring in use today American Oak stands pre-eminent for color, texture and durability.

—Keeps the "For Rent" and "For Sale" signs off the property. Landlords know what is best in flooring.

—Solving the floor problem is possible by OAK FLOORING.

—Increases the selling and renting value of any building, and attracts a better class of buyers, or tenants.

See our page 379—1917 Sweet's Catalogue.

Write for booklets—"America's Best Flooring."

Oak Flooring Service Bureau

1603 UNION TRUST BLDG., CINCINNATI, OHIO

RUBBER GOODS

for

ALL KINDS OF BUILDINGS

including

MATS MATTING TILING

Cotton, Linen and Rubber HOSE

FIRE EXTINGUISHERS

GOODYEAR RUBBER CO.

587-589-591 Market St. San Francisco, Cal.

LOOK BEFORE YOU BUILD

When You Build a $1,000 Cottage

you are making an investment every bit as important to YOU as a $1,000,000 skyscraper would be to ITS owner. You ought to be just as certain that you are getting the best materials at the best possible price. And you can be—without any trouble, can select the right material for every purpose from the sidewalk to the shingle-roof—at the

Building Material Exhibit

Many intensely interesting displays of building materials and equipment. If you cannot come, write and let us aid in solving your building problems. Send us your plans and we will secure complete estimates for you without any charge or obligation.

Building Material Exhibit

77 O'Farrell Street, San Francisco

Phone SUTTER 5333 **"LOOK BEFORE YOU BUILD"**

HOTEL ST. FRANCIS

SAN FRANCISCO

Most Beautifully Decorated Public Rooms in the World
European Plan from $2.00

Management :: :: :: JAMES WOODS

STEEL BARS FOR CONCRETE REINFORCEMENT

TWISTED SQUARES, PLAIN SQUARES AND ROUNDS
We Will Make Lump Sum Bids on Reinforcement Fabricated and Installed.

PIG IRON, COKE AND FERRO ALLOYS

WOODS, HUDDART & GUNN

444 MARKET STREET Tel. Sutter 2720 SAN FRANCISCO, CAL.

STEEL OPEN HEARTH BARS FOR CONCRETE REINFORCEMENT

Square Corrugated and Cold Twisted, Plain Rounds and Squares
-----MERCHANT STEEL-----
Flats, Angles, Channels, Rounds, Squares, Rivet & Bolt Steel, Structural Shapes

PACIFIC COAST STEEL COMPANY

PHONE SUTTER 1564

General Office, Rialto Bldg., San Francisco
Sales Office, " " " "
Sales Office, Union Oil Building, Los Angeles
Sales Office, Seattle, Wash.

ROLLING MILLS:
South San Francisco
Seattle, Wash. Portland, Ore.

"Havemeyer" Deformed STEEL BARS

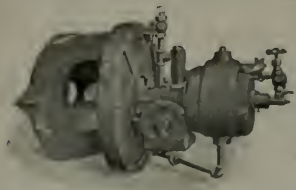
FOR REINFORCED CONCRETE CONSTRUCTION

Southern California Iron & Steel Co.

FOURTH AND MATEO STREETS
LOS ANGELES, CAL.

W. B. KYLE, New Call Building,
San Francisco Representative.

THE RAY OIL BURNING SYSTEM—1917 MODEL



Improvements: Enclosed motors, dust, oil and water proof; oil-cooled motor runs 75 per cent cooler; oil heated electrically. Only one place to lubricate for entire machine, and many more exclusive features. Send for catalogue

W. S. RAY MFG. CO.

Salesroom, 218-220 Market St., SAN FRANCISCO
Phone Kearny 199

Works, Bosworth, Milton & Rousseau, S. P. R. R., San Francisco. Phone Mission 8022

John C. Austin, Architect

General View of New Los Angeles High School. Style of architecture is Tudor. Entrance and tower, reminiscent of the Collegiate architecture of Oxford and Cambridge, England. The walls and ceilings of this magnificent structure are covered with two well-known Brininstool Standard Paint Products. The building has a frontage of 350 feet and contains 260,000 square feet of floor space.

BARBER BRADLEY CONSTRUCTION COMPANY
General Contractors

W. E. TALBERT PAINT CO.
Painting Contractors

Brinin

An architect or contractor is always safe in specifying Brininstool Paint Products.

The BRININSTOOL COMPANY
(Established 1894)
Monufacturers of Paints and Kindred Products
LOS ANGELES, - - - CALIFORNIA

ANOTHER VICTORY!

Entire walls and ceilings of the new and beautiful

Los Angeles High School

Covered with Brininstool's

San-A-Cote and
(Can be Scrubbed)
Vel-Va-Cote
(Washable Flat)

Two Standard Wall Finishes

To Obtain Best Results Don't Fail to Use

Brininstool Paints

A FITTING climax to the finishing of the Los Angeles schools under the six-and-one-half-million dollar bond issue is the completion of the new Los Angeles High School, one of the largest school buildings in the world, costing $540,000.

An equally fitting climax was the use of San-A-Cote and Vel-Va-Cote —two Brininstool wall finishes that had already been used on 80 per cent of the new school buildings. It was, therefore, only natural that the architect, the school board and the contractors should turn to these wall finishes, which had proved in every way dependable.

DISTRIBUTORS

The Brininstool Co., care of Hazlett Warehouse Company, 310 California Street, San Francisco, Cal.; Schutz Paint Co., Fresno, Cal.; Schneider, Chappell & Jones, Sacramento, Cal.; Salt Lake Glass & Paint Co., Salt Lake City, Utah; Griffin Paint Co., Ogden, Utah; Ernest Miller Wall Paper Co., 172 First St., Portland, Ore.; Hickox Crampton Paint Co., Tacoma, Wash.; Campbell Hardware Co., First and Madison Sts., Seattle, Wash., Imperial Valley Hardware Co., El Centro, Calexico, Imperial, Brawley Seeley; Spokane Hardware Co., Spokane, Wash.; Ellis Paint Co., Butte, Mont.; Simons Paint and Paper Co., Missoula, Cal.

The GOLD MEDAL MAIL CHUTE

INSTALLED IN THE NEW SAN FRANCISCO CITY HALL AND THE WHITE MARBLE MERRITT BUILDING, LOS ANGELES

Given highest award at Panama-Pacific International Exposition, 1915.

Represented on the Pacific Coast by

United States Metal Products Co.
525 Market Street
SAN FRANCISCO
Agents for California and Oregon
F. T. CROWE & CO.
Seattle
Agents for Washington.
American Mailing Device Corporation

The Cutler Mail Chute

Mail Box—L. C. Smith Building Seattle, Wash. Gaggin & Gaggin, Architects, Syracuse, N. Y.

Pacific Coast Representatives:

San Francisco, Cal., THOMAS DAY COMPANY.

Portland, Ore. C. W. BOOST.

Seattle and Tacoma, Wash., D. E. FRYER & CO.

Spokane, Wash. E. C. TOUSLEY.

Cutler Mail Chute Co.,
ROCHESTER, N. Y.
Cutler Building.

BIGLEY'S

Curtains
Decorated Lamps
and Pottery
Fine Upholstered
and Period
Furniture

498 GEARY STREET
San Francisco, Cal.
Telephone: Franklin 5919

THE·L· SCHREIBER & SONS Co

ORNAMENTAL IRON & BRONZE
STRVCTVRAL STEEL
CINCINNATI

SAN FRANCISCO
WESTERN BVILDERS SVPPLY CO
155 NEW MONTGOMERY ST.
LOS ANGELES
SWEETSER & BALDWIN SAFE CO
200 EAST 9TH ST

CRANE FITTINGS

MALLEABLE CAST IRON

ARE THE STANDARD

because they do the work that they are made to do with a liberal factor of safety. Accurately made, chamfered threads, and properly proportioned they are the choice of all good architects.

We carry in stock at all times the largest line of sizes and shapes so that we may meet promptly whatever calls are made for these goods. Our Catalogue No. 40 (which will be sent on request) further illustrates and describes the extensive line of **CRANE FITTINGS.**

CRANE CO.

PLUMBING SUPPLIES

Steam and Hot Water Heating

2ND & BRANNAN STREETS SAN FRANCISCO

H. E. BOTHIN, PRESIDENT
W. H. FRENCH, VICE-PRES. AND GEN. MANAGER
R. B. GIRDWOOD, SECRETARY

JUDSON MANUFACTURING CO.

MANUFACTURERS OF
OPEN HEARTH STEEL
INGOTS, BARS, PLATES AND SMALL SHAPES

STRUCTURAL AND BRIDGE WORK
FOUNDRY, MACHINE AND PATTERN WORK
SHAFTING, BOLTS, SPIKES ETC.

MAIN OFFICE AND SALESROOM
819-823 FOLSOM STREET
TELEPHONE BUTTER 8848

OPEN HEARTH STEEL BARS

STRUCTURAL STEEL

Machine Work—Bolts—Castings
Pattern and Blacksmith Work

WE STOCK THEM

LET US SHOW YOU

REG. U.S. PAT. OFF.
PEDS
PAT. FEB. 15, 1916.

PACIFIC BUILDING MATERIALS CO.

523 Market St. TELEPHONE KEARNY 3323 S. F.

FORUM BUILDING, SACRAMENTO, CAL.
R. A. Herold, Architect

The above is a Progress Picture of the Four Story addition to Sacramento's Largest Office Building, Now Completed.

STRUCTURAL STEEL FABRICATED AND ERECTED BY

The Palm Iron and Bridge Works

(Incorporated)

15th and R. Sts., Sacramento, Cal.

CALIFORNIA ARTISTIC METAL & WIRE CO.
J. T. McCORMICK, PRESIDENT
ORNAMENTAL IRON AND BRONZE
349-365 SEVENTH ST. SAN FRANCISCO

MORTENSON CONSTRUCTION CO.
CONTRACTORS FOR STRUCTURAL STEEL AND IRON
H. MORTENSON, Pres. CHAS. G. MORTENSON, Vice-Pres. and Mgr.
OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS
PHONE: MISSION 5033 SAN FRANCISCO, CAL

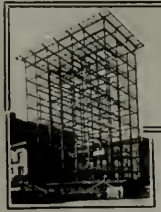
WEST COAST WIRE AND IRON WORKS
MANUFACTURERS OF
ARTISTIC BRONZE, IRON AND WIRE WORK
OF EVERY DESCRIPTION AND FINISH
861-863 HOWARD STREET SAN FRANCISCO, CAL.

FAIR MANUFACTURING COMPANY
J. FEY KERT, Proprietor
ORNAMENTAL AND MISCELLANEOUS IRON WORK
617 BRYANT STREET, SAN FRANCISCO Douglas 5122

THE GOLDEN GATE IRON WORKS
STRUCTURAL STEEL
1541-1549 HOWARD STREET, BETWEEN 11th AND 12th STREETS
Tel. Market 5445 San Francisco

Telephones Mission 139—Mission 59 A. A. Devoto, President
CENTRAL IRON WORKS, Inc.
STRUCTURAL STEEL
Office and Works: 621-651 Florida Street
Bet. Harrison and Bryant, 18th and 19th SAN FRANCISCO, CAL.

The U. S. Government insists upon Good Screening—
Why not you? WATSON METAL SCREENS are specified in Federal Contracts.
Write for Samples, Specifications and Circulars.
RICHARD SPENCER, California Agent
Phone Kearny 2915 801-803 Hearst Building, SAN FRANCISCO



SCHRADER IRON WORKS, Inc.
STRUCTURAL STEEL CONTRACTORS
Fire Escapes, Waterproof Trap Doors, Ornamental Iron Work
1247-1249 HARRISON STREET SAN FRANCISCO, CAL.
Bet. 8th and 9th Telephone Market 337

P. Noble, Pres.
E. B. Noble, Vice-Pres.
A. E. Wilkins, Sec'y

Beam, Angle, Channels, and Universal Mill Plates for immediate shipment from stock

Pacific Rolling Mill Co.

SUPPLIERS OF

FABRICATED STRUCTURAL STEEL, Forgings, Bolts, Rivets, Frogs, Switches, Cast Iron Castings

General Office and Works
17th and MISSISSIPPI STS., SAN FRANCISCO
Telephone Market 215

W. B. MORRIS, President H. M. WRIGHT, Vice-President L. J. GATES, Secretary

WESTERN IRON WORKS

STRUCTURAL IRON and STEEL CONTRACTORS

Gas Holders, Vault Linings, Jails, Fire Escapes, Beams, Channels, Angles and Steel Wheelbarrows Carried in Stock

Phones: Kearny 575
J 1259

141-147 BEALE STREET
132-148 MAIN STREET
SAN FRANCISCO, CAL.

TELEPHONE, MISSION 1763

C. J. HILLARD CO., Inc.

MANUFACTURERS OF

Bank and Office Railings. Elevator Enclosures and Cars.
Cast Iron Stairs and Store Fronts. Wire Work. Fire Escapes.

Nineteenth and Minnesota Sts.
Next to California Canneries

San Francisco, Cal.

Structural Steel
Ornamental Iron
Ornamental Bronze
Prison Work
Vault Work
Metal Furniture
Filing Devices
Library Shelving
Stock Room Shelving
Steel Lockers
Electroliers

RALSTON IRON WORKS

INCORPORATED
TWENTIETH AND INDIANA STREETS
SAN FRANCISCO, CALIFORNIA
PHONE MISSION 5210

Antiquities, Artistic Ornaments for the Interior

A little expenditure adds to your Home Decorations the Grace of Genuineness and Rare Artistry.

A. FALVY

578-580 SUTTER STREET

Tel. Sutter 6939 SAN FRANCISCO

Architects designing hotels, apartment houses, theatres and office buildings, should keep in mind the fact that THREE BARRELS OF FUEL OIL burned by the

Fess System

will equal the heat produced by a TON OF COAL — *Economy for the Owner.*

And that the FESS SYSTEM is the Only Fire-Proof Rotary Burner manufactured — *More Economy for the Owner — Less Insurance to pay.*

Fess System Rotary Crude Oil Burners

FOR HEATING, POWER, COOKING

Office and Factory — 218 Natoma St., San Francisco

Branches — 1310 So. Hill St., Los Angeles; 428 Alder St., Portland, Ore.; 132 B St., San Diego.

FLY-OUT

Hipolito

EVEN TENSION

Window Screens Screen Doors

ROLLER SCREENS

For Casement Windows

METAL FRAME SCREENS

SEE DISPLAY AT

Building Material Exhibit

77 O'Farrell St. San Francisco

Simpson & Stewart

FACTORY DISTRIBUTORS

565 16th St., Oakland, Cal.

TELEPHONE LAKESIDE 415

MAY BE OPENED
AT THE TOP
FOR LIGHT
BETTER THAN
WINDOW SHADES
BURLINGTON
VENETIAN BLINDS
can be adjusted to *let in* light and air, yet *keep out* the sun and the gaze of outsiders.
For the home, school, bank and office building.
Look for the name Burlington and be assured of the best.
AND CLOSED
AT THE BOTTOM
FOR PRIVACY

Burlington Venetian Blind Co.

BURLINGTON VT. 365 MARKET ST., SAN FRANCISCO

Illinois Automatic Vacuum and Vapor Systems of Heating

Improved with graduated control. You can have much heat or little as conditions demand. Our Thermo Trap prevents any waste of heat and consequently saves fuel. Used in the biggest buildings and factories all over the United States and Canada

We also manufacture a full line of Hughson, John Davis, Eclipse Pressure Reducing Valves and Back Pressure Valves, Oil Separators, etc.

"Twenty five years of quality."

We carry a full line in San Francisco.

ILLINOIS ENGINEERING COMPANY

JAS. I. KRUEGER, *Representative*

559-561 Pacific Building, San Francisco

Telephone: Kearny 3047

DON'T WAIT — OR LOSE TIME HUNTING
Get the Man You Want Instantly. USE THE

"National Calling System"
THE INSTANT MAN FINDER

WESTERN REPRESENTATIVES:

Sierra Electric Construction Company

619 CALL BUILDING, SAN FRANCISCO Phone Sutter 2297

JOHN A. HOOPER, Pres. FRANK P. HOOPER, Vice-Pres. A. W. HOOPER, Sec'y

Hooper Lumber Company

Wholesale and Retail Dealers in

OREGON PINE AND REDWOOD

17th and Illinois Sts., San Francisco

Car shipments to all Central California Points
Schooner shipments to Bay and River landings

Contractors' House Bills solicited
Phone Market 5313

OIL BURNERS
VACUUM PLANTS
ICE MACHINES

The Three Essentials for the Up-to-date HOTEL and APARTMENT HOUSE.

With a JARVIS Guarantee Your Troubles Are Over.

Home Manufacture—Everything but the motors

T. P. JARVIS CRUDE OIL BURNING COMPANY

Phone Market 3397 275 Connecticut Street, SAN FRANCISCO

GRAVEL

NILES SAND GRAVEL & ROCK CO.

GRAVEL BEDS AND PLANT, NILES, CALIFORNIA
MAIN OFFICE
MUTUAL BANK BUILDING
704 MARKET ST.
SAN FRANCISCO

TELEPHONE DOUGLAS 182

Crushed and screened concrete Gravel and Rock. Sharp, clean Concrete Sand, or Topping. All from fresh water, thoroughly washed, and in any size or mixture, with or without sand, as desired.

Free from Salt.

A. F. EDWARDS, President
J. M. FABBRIS, Vice-President
J. A. MACKENZIE, Secretary
CHAS. F. EISELE, J. RUBIOLO, Asst. Managers

AMERICAN
MARBLE & MOSAIC CO.

25-29 Columbia Square, San Francisco
Telephone Market 5070

Factory on Canal, South San Francisco Telephone South San Francisco 161

THE BITURINE COMPANY

Specializing in Protective
Coatings for Iron and Steel

STRUCTURAL STEEL PAINT
INTERIOR TANK ENAMEL

Telephone
Kearny 4478

24 CALIFORNIA STREET
SAN FRANCISCO

THE KINNEAR MFG. CO.
COLUMBUS, OHIO

STEEL ROLLING FIREPROOF
DOORS AND SHUTTERS

Agents
Seattle - Portland - Los Angeles - Salt Lake City

San Francisco Office 517 Rialto Building

THE ARCHITECT & ENGINEER

VOL. L. OF CALIFORNIA No. 3

CONTENTS FOR SEPTEMBER, 1917

	Page
Cover—School in Lake County, California By Morrow & Garren, Architects	
Frontispiece—Administration Building, Johns Hopkins University Parker, Thomas & Rice, Architects	38
Notes on Recent Progress and Tendencies in School House Design Horace G. Simpson, A. A. I. A.	39
Group Plan Is Popular Type in Present Day School Design	55
Relations Between School Boards, Their Superintendents and the Architect John J. Donovan, A. I. A.	59
Necessity of Adaptation of Building to School Organization S. A. Challman, Commissioner of School Buildings, Minnesota	76
An Alternate Lighting Plan for School Rooms Louis Cowles, Architect	81
Some Standards for the School Builder William C. Bruce	83
The El Paso High School Trost & Trost, Architects	87
Islam Temple—An Example of Arabian Architecture J. F. Dunn, Architect	93
Dry Rot—Its Causes and Prevention E. J. Goodacre, A. M. Inst., C. E.	95
The Province of the Architect	99
New California State Building Laws in Effect	101
No Drop in Building Material Prices	102

Published Monthly at 626-627 Foxcroft Building, San Francisco in the interest of

ARCHITECTS, STRUCTURAL ENGINEERS, CONTRACTORS AND THE ALLIED TRADES OF THE PACIFIC COAST

Yearly Subscription $1.50
Single Copy 25 cents

Entered at San Francisco Post Office as Second Class Matter

Copyright 1917 by A. I. Whitney
All Rights Reserved

Frontispiece
The Architect and Engineer
of California
for September, 1917.

ADMINISTRATION BUILDING, JOHNS HOPKINS UNIVERSITY, BALTIMORE, MARYLAND
PARKER, THOMAS & RICE, ARCHITECTS

THE
ARCHITECT
AND
ENGINEER
OF CALIFORNIA

SEPTEMBER, 1917 Vol. L. Number 3.

NEVILLE'S COURT, TRINITY COLLEGE, CAMBRIDGE, ENGLAND

Notes on Recent Progress and Tendencies in Schoolhouse Design

By HORACE G. SIMPSON, Architect, S. F.

AN issue devoted exclusively to schoolhouse architecture, constituting a sort of pictorial review of recently completed work, naturally brings to mind questions as to the nature and direction of progress; we wish to know if the generous expenditure for this important branch of the public service is getting us ahead and how. Our rapid increase in wealth and population in recent years has brought forth such a great volume of school building, and the increasing diversity of the school curri

MARYLAND STATE NORMAL SCHOOL.
PARKER, THOMAS & RICE, ARCHITECTS

culum, even in the elementary schools, has produced such a variety in the plan and design of school houses, that the task of indicating the measure, and defining the direction of progress is not an easy one. We are, of course, chiefly concerned with school architecture in California, but as progress of any sort is to be measured only by comparison, it will be desirable to extend our survey to include a glance at the most successful recent buildings in other sections of the country and abroad, and also to include certain historic foreign examples which are of interest as the prototypes from which our present work has been developed. This inclusion of outside work will also offset the tendency to mental in-breeding which results from too much focussing of attention upon purely local activity.

ACADEMIC BUILDING, SWEETBRIAR INSTITUTE (VIRGINIA)
Cram, Goodhue & Ferguson, Architects

It will assist us to a real understanding if we consider briefly the trend of modern thought in relation to the business of elementary education and try to get the educator's point of view, for, while the architect is responsible for the design of the building and, in a measure, for the arrangement of the elements of the plan, it is chiefly to the work of the educator that these elements are due.

Starting with a very meager list of studies which, not so many years ago, comprised little more than the traditional "three R's," there has been a constant increase in the number of subjects offered to the children with the democratic intention of conferring on all, some of the advantages of wider perspective and literary enjoyment which, formerly, were reserved to the few who attended college. Side by side with this broadening of the course of study, partly perhaps, as the cause of it, there has been an entire change in the attitude of the educator toward the child. The belief is now generally accepted that education is more readily

GLASGOW SCHOOL, ST. LOUIS, MO.
Wm. B. Ittner, Architect

SCHOOL AT CRESSWELL, DERBYSHIRE, ENG.
BREWILL & BAILLY, ARCHITECTS

acquired and retained if the child is led instead of being driven, and even more recently the practice has been to curtail even leadership and to substitute the pupil's initiative aided by the teacher's "suggestion." It is not our business here to renew the debate as to the wisdom of these changes, but merely to take note of the fact that, for better or for worse, the birch rod and what have been aptly termed "lock step methods" of education are extinct. In their place have come a real effort to understand the working of the child's mind and an admission that the most permanent and valuable effects upon mind and character come unconsciously from within rather than forcibly from without.

CLARK SCHOOL, ST. LOUIS, MO.
Wm. B. Ittner, Architect

Another radical change from the old order is seen in the increasing number and completeness of "vocational" courses, which have for their object the fitting of children to earn a living immediately upon leaving school. This change is in some respects of a quite opposite tendency from the change of discipline mentioned above, operating to narrow rather than broaden the mental perspective. Like the previous change, it is the subject of vigorous debate among educators, but as remarked before, the architect's business is not debate, but the recognition of accomplished facts.

BLOW SCHOOL, ST. LOUIS, MO.
Wm. B. Ittner, Architect

The revolution in the attitude of the educator toward the child has had a radical effect upon the plan and design of schoolhouses.

A quarter century ago school buildings generally were of a grim, jail-like aspect, quite in harmony with the sort of penal servitude which education at that time resembled. They had lost the simplicity of the primitive district schools, many of which, though unadorned, were not unattractive, and had taken on that chilly, stupid, and forbidding character which material expansion without the saving graces of sentiment and esthetics always produces. They were what is termed "institutional," which term signifies a

ENTRANCE, SCHOOL IN HILLSBOROUGH, CALIFORNIA
Lewis P. Hobart, Architect

COURT, SCHOOL IN HILLSBOROUGH, CALIFORNIA
Lewis P. Hobart, Architect

YALE UNIVERSITY LIBRARY, NEW HAVEN, CONN.
Charles C. Haight, Architect

public duty grudgingly performed, with faith, hope, and charity, conspicuous by their absence. The buildings of this period were quite as ill fitted from the practical standpoint—lighting, ventilation, safety, etc., receiving very little serious study. It is probable that many factories of the time were built with more regard for the welfare of the occupants, not as a philanthropy either, but strictly as a business proposition. Gradually investigations regarding essential factors were undertaken, and as a result a great deal of valuable data, concerning lighting, ventilation and the like, was obtained, which began to have a beneficial effect upon design. Planning was almost revolutionized by the adoption of single side light and again by the use of light from one point of the compass, which has proven so desirable in certain climates. The development of new studies has required special rooms and new methods of school administration have required new systems of grouping. A tendency which has lately been very marked is to have the school auditorium used by the community after shool hours, and this has caused it to be placed near the ground level instead of on an upper floor as formerly, sometimes even in a separate building. Manual training departments are often removed for other reasons, and thus a start has been given to the group principle as distinguished from the single large building, which formerly was universal. New materials and methods of construction have also had their influence upon types of design.

In the past decade especially, there has been evident an increasing intelligence in the study and solution of the problems of school design, partly by reason of a more honest and intelligent body of public officials and partly because of a better trained and more devoted class of architects. The entrance of women into public life has also been of benefit. The leaders of the movement have been persons not merely of ability and professional skill, but of sympathetic nature, with minds keenly alive to the various psychological and social problems in-

WASHINGTON SCHOOL, EAST ORANGE, N. J.
Guilbert & Betelle, Architects

CORPUS CHRISTI COLLEGE, OXFORD, ENGLAND

COURT, TRINITY HALL, CAMBRIDGE, ENGLAND

volved in school training and school building. These men have intuitively felt the ennobling influence of beautiful form on the character of children in the formative period and have rebelled against the factory and jail-like type of building advocated by the devotees of extreme public economy and a misguided and materialistic conception of "efficiency." Out of this rebellion have come new and promising types of school building indicating a saner conception of what the community owes to the coming generation. It is being recognized that a building which is gloomy and depressing in its effect and which the student enters with reluctance and leaves with relief, kills enthusiasm in the classes and imposes a handicap on the instructing staff which results in a loss on the investment which the building represents.

INNER COURT, WESLEYAN SCHOOL, MIDDLETON, ENGLAND *Edgar Wood, Architect*

It seems to the writer that lately there has been relatively less emphasis upon mechanical equipment and sundry details of so-called "Standard Design," not that there has been any falling off in the excellence of these very necessary adjuncts, but because architects, busying themselves about architectural design in its broadest sense, have focussed public attention upon the main elements of the problem. It is not unlikely that many of the "Old Guard" type of school architects were saved from a deserved oblivion by diverting public attention from the "piffling" and stereotyped designs which were their own, to the excellence of ventilating systems, mechanical equipment and the like, which were designed for them by really competent engineers.

MORDEN COLLEGE, BLACKHEATH, LONDON, ENGLAND

MAGDALEN COLLEGE QUADRANGLE, OXFORD, ENG.

It seems in order to note briefly some of the specific factors which have made the California school what it is today and which will determine what the school of the future is to be.

CLIMATE

No one ever thinks of California without thinking of the climate. If he is a visitor he isn't allowed to and if a native he does not dare. As a matter of fact there is no such thing as *THE* California climate. The variation in latitude and elevation is so great that we have examples of almost every kind af climate known. But the notion of a special characteristic climate persists and has been the cause of much confusion with regard to types of school suited to particular localities. Types which were suited to the semi-tropical south, on cheap land and with extensive grounds, are attempted in the fog belt around San Francisco bay, where the climate, in spite of certain advantages, certainly is not tropical, and where also the high cost of land makes a more compact plan advantageous. In many parts of the State the extreme heat has had a very marked effect on design, particularly in the provision for natural cross-ventilation and in facing the rooms away from direct sun light. The comparative mildness of the winter outside of the mountain districts has permitted a less compact arrangement of rooms than is required where severe winters occur. This fact has given impetus to the tendency toward groups of separate buildings which was mentioned before. This tendency is one of the most marked characteristics of our school planning and offers very great promise.

DENSITY OF POPULATION

As yet problems which arise from density of population and excessive cost of land have been rare in California, as there has not yet been here the excessive concentration in cities which has occurred in the East. With the increase in manufacturing we may expect this and should realize in advance the evils it may produce if not provided for. It has generally happened that the result has been the erection of schools of great size, which have taken on an "institutional" character in spite of the skill of the designers, and which introduce the problem due to the tendency toward loss of personality on the part of young children assembled in groups of excessive size. It would seem that if this centralization is necessary from reasons of administrative economy, some architectural expedient such as the quadrangle units of the English university would help to solve the social and psychological problems.

THROOP POLYTECHNIC INSTITUTE, PASADENA, CALIFORNIA
Myron Hunt and Elmer Grey, Architects

MATERIALS

The diversity of materials available is very great and constantly increasing, and while this great variety has some advantages it has also certain very marked ill effects; one being that there is not the perfection in design and workmanship which results from constant practice in the use of a limited number of materials; another is that the public taste, surfeited with novelty, is led to mistake novelty for merit, and many buildings which are crude and commonplace or actually hideous are accepted without protest as being "the latest thing" or "up to the minute." None but a skilled gourmand may be trusted to select a dinner with wisdom and simplicity from a very extensive mênu and likewise our very extensive selection of materials, while presenting no difficulties to the more competent designers, is like dynamite in the hands of those less skilled.

STANDARDIZATION

As noted before, the development of modern schoolhouse architecture was preceded and accompanied by investigations, and the collection and tabulation of data, bearing on lighting, ventilation, unit cost and many other points. This was a very necessary process and the results are of the greatest value and in constant use. Often, however, there is an attempt to standardize construction and design to the point of inflexibility. The formula which was useful as a servant becomes tyrannical as a master and a bar to progress. The advocates of excessive standardization should reflect that we do not now possess all the knowledge that is ever to be, and that the limitation of experiment is the surest way to obstruct progress. Imagine the calamity which would have resulted from a "ukase" in 1870 endowing the dreadful stuff of that period with immortality! Too much standardization has also had an effect not foreseen by its advocates—namely enabling mediocre or incompetent architects to attain a certain facility in mechanical "rule o' thumb" methods of design and to pass unchallenged as "school experts."

OPEN-AIR AUDITORIUM, HIGH SCHOOL, MONROVIA. PROSCENIUM ARCH ENCLOSURE SHOWN IN PLACE *Allison & Allison, Architects*

OPEN-AIR ROOMS

The climate in many parts of the state permits if, indeed, it does not require open air class rooms, auditoriums and the like. Many very effective substitutes have been devised in the way of movable partitions and other methods of cross ventilation and in some schools outdoor seating in courts has given a sort of auditorium, but as yet there have been few genuine open air class rooms specially designed as such nor is there an example of a true "garden theatre" or auditorium pertaining to any school in California known to the writer. It seems that here we have a field which offers very great possibilities.

COMMONS ROOM, GRADUATE COLLEGE, PRINCETON. *Cram, Goodhue & Ferguson, Architects*

INTERIOR DESIGN

For some reason the exterior design of school buildings has made a much greater advance than that of the interior. Lack of funds is frequently given as the cause for this, but, if this is the case, it would seem to be the duty of the architect to apportion the costs so as to avoid the "all front and no shirt" effect produced by a building with a highly embellished facade and a jail-like bar-

KINDERGARTEN ROOM IN TOLEDO, OHIO
Edwin M. Gee, Architect

renness within. It is not solely a question of money. The writer remembers certain vaulted rooms in monasteries in Italy whose walls were bare and the furnishings of the most meager description, and even a cobbler shop in Florence which was an unpainted plaster vault containing nothing but the litter of tools belonging to the owner's trade. These rooms had a pleasant tranquil quality due entirely to their pleasing proportion and to the absence of unsightly or irrelevant objects. It is certain that much is still to do in our schools in the way of producing pleasant restful interiors, with the appropriate degree of embellishment and no more.

COMBINATION ROOM, PETERHOUSE COLLEGE, CAMBRIDGE, ENGLAND

GRAMMAR SCHOOL, GLENDORA
Allison & Allison, Architects

DETAIL, GRAMMAR SCHOOL, GLENDORA
Allison & Allison, Architects

ARCHITECTURAL STYLE

Some cynic has remarked that the "style" of a projected school building is determined in about the same fashion as a woman choosing a hat. It is not well to be a cynic. The writer is glad he is not one. But it must be admitted they often hit the nail on the head. Fortunately, in recent work, there has been a tendency to regard style in a more serious manner, so that the "millinery" remark quoted above has not the same force as formerly. It is to be regretted that there has not been a more intelligent and successful use of the Mission style in some of our public schools. Its position as the indigenous style of the Coast region would render this especially fitting. And, despite the dis-repute which galvanized-iron travesties have brought upon it, despite the difficulties imposed by the large glass area of the modern school, in capable hands and with sufficient study and enthusiasm it should be possible to develop designs recalling the essential charm of the old work. A parallel case in another part of the country has recently been completed: the Johns Hopkins University at Baltimore. Here the indigenous style was Colonial, a very fine example "Homewood" actually existing upon the grounds. From study of this fine old mansion the architectural expression of the new buildings was determined and the result is doubly satisfying; a thing of beauty and a strictly indigenous and American product. The remarks above regarding the Mission style should not create an impression that it, alone, is entitled to place, for, while the missionaries were the first settlers, far greater numbers came over the mountains or around Cape Horn from the Eastern states, which fact would appear to give equal fitness here to the derivatives of the Colonial architecture of the Atlantic states and to the Tudor and Georgian styles of England from which our Colonial style sprung.

THE ESTHETIC SIDE OF THE PROBLEM.

Coming now to the esthetic side of the problem we come to the very weakest link in the chain, and the most important, because most directly affecting the minds of the children. Despite the very gratifying advance noted in the attitude of educators, and the marked improvement in planning, equipment, and construction, it appears that the esthetic and psychological side of the problem is not yet receiving its due share of attention. It should not be inferred from this that beautiful buildings are not built, but that they are not the majority. And of these beautiful buildings many are beautiful in a cold and distant way which does not touch the mind of the child. Certain examples exist which leave little to be desired;—Mr. Ittner's superb work in St. Louis, a number in the East, chiefly in the New England states, and in portions of New York, New Jersey and Pennsylvania, and a few fortunately in California; more of them, so far, in the southern part of the State. But when we consider the vast sums spent, and the number of buildings erected, the proportion which exhibit in a marked degree the trend toward the "domestic" and intimate quality suited to the child's mind, is woefully small. Architecture seems to lag far behind the educators, of whose thought it should be the expression. And in this business of school designing no amount of technical facility or professional knowledge can take the place of a sympathetic understanding and an earnest effort to touch the mind of the child through beautiful and simple form. It would almost appear that architects should forget architecture, for the time, and take up psychology—or go to school again and see how it feels.

Whatever may be the value of Madame Montessori's methods as applied to our American conditions, there is no doubt that she has rea

dered a service to education in America by the introduction of her phrase "The House of Childhood."

The term serves to recall to the mind the real purpose for which schoolhouses are built. And, obviously, there is need of such a reminder when one notes how frequently schoolhouse design is led astray from this main purpose.

The belief is becoming general that the true function of schooling is the development of character, and that, to this end, the curriculum and the class room routine are not more important than the associations and environment of the children. To provide an environment which shall have a beneficial effect upon the mind of the child is the true duty and the highest service which the designer may accomplish.

In view of the fact that the child spends more of his waking hours in school than in his own house, the school buildings should be regarded as his home, and should have the domestic rather than the institutional character, and every effort should be made to mitigate the sense of imprisonment and restriction which, unfortunately, so often prevails and which diminishes the receptiveness of the child's mind.

Whoever has visited Oxford and Cambridge universities in England or the older colleges of the Eastern states, must recall with keenest delight the tranquil, home-like atmosphere of those places, the quaint charm of the old buildings and their luxurious setting of trees, ivy and velvet turf. While these buildings are obsolete in some minor technical respects they are still useful and still exert a potent and beneficial influence upon the throngs of students who congregate there. They are a visible proof of the indestructibility of beauty, and we may well inquire if, in the pursuit of novelty and mechanical ingenuity, we have not forgotten or cast aside those esthetic and spiritual qualities of architecture which are more permanent and equally essential to the process of education.

It must not be inferred from this that we should take a step backward or refuse to take one in advance, but that we should, in advancing, hold fast to all that was good of the old, and add the new to it, or we shall be as children who cast aside each toy to clutch the new one offered.

We should, once for all, disabuse ourselves of the notion that there is any real conflict between beauty and utility. This ancient fallacy has been the shield and bulwark of mediocrity since Adam was a boy. There will always be artists who ignore the practical, and always practical men who cannot comprehend or create beauty; but in competent hands the conflict disappears and the material needs of the school are satisfied without sacrifice of the esthetic qualities which are equally essential to the happiness of the child and to the progress of education. We must bear constantly in mind that while the mechanical novelty of one generation becomes obsolete in the next, true beauty is of no time—its beneficial influence is perennial.

* * *

For Review of State Building Plans

The San Francisco committee to request from Governor Stephens an impartial review by a jury of disinterested architects of the plans for the California State building in the San Francisco Civic Center has been named by Mayor Rolph, acting on the authority given him by the Board of Supervisors. The members of the committee are Supervisors McLeran, Brandon and Wolfe, Messrs. John Galen Howard and Arthur Brown, Jr., architects, former Supervisor Paul Bancroft and Mr. Louis H. Mooser.

PORTION OF GROUP, WILMINGTON HIGH SCHOOL
Allison & Allison, Architects

Group Plan is Popular Type in Present Day School Design

THE group plan for school buildings, which was introduced in California four or five years ago, is meeting with increased favor, and where there is ample ground area, this type of construction now takes precedence over all others. It has many advantages as well as some drawbacks. Naturally, it is not feasible in the large cities, where real estate is high and ground valuable.

There are many cities that are the centers of large communities or districts consisting of small villages and towns, each seeking the advantages of higher education. These towns not being in themselves able to provide facilities, join with one another in forming high school districts, and in the erection of union high schools, gaining by concerted effort, that which individually they could not accomplish.

In California the solution has been the acquiring of large properties of five to twenty acres in size and the adoption of the plan heretofore followed principally by colleges and universities. Upon such tracts a campus is formed surrounded by a group of buildings, each designed for a specific purpose.

The large sites in most cases are acquired in the outskirts of the city where vacant land is comparatively cheap, and not so far out as to be inconvenient or inaccessible. Invariably it has been but a short time before the city has grown up to and beyond the school. An institutional group of this type is a commercial asset to any growing community and full advantage is taken of it.

The group plan when properly handled will permit additions to the buildings and to the group without the necessity of committing architectural blunders and introducing structural wastefulness.

In the more recent buildings, a plan is outlined looking forward and providing for the future. In the group plan there is no necessity for the

buildings being more than two stories in height. In some cases there have been groups composed of all small one-story buildings, ten to twelve in number, for a school of four hundred students. But this seems to be carrying the idea to the extreme, a natural mistake in any sudden and radical reform, declares Mr. H. T. Withey of Los Angeles in the American Architect. The chief points to be advanced for the many buildings are that they give students fresh air and exercise between classes, and in case of fire, less property loss. But to offset these there are so many points or features of disadvantage that it is more conservative to have fewer buildings and those of two stories in height.

If, for example, eight hundred to fifteen hundred students are to be accommodated, a group of eight buildings would be quite sufficient, consisting of the Administration building, Science building, Commercial building, Manual Arts building, Agricultural building, Gymnasium, Cafeteria and Power House. Of these, the buildings for manual arts, agriculture, gymnasium, cafeteria and power need be but one story in height.

A group of too many buildings is uneconomical in construction in many ways and the departments of study become so segregated as a result, that the administration is burdensome.

For the city of ordinary size one high school group serves for all purposes.

In Southern California where agriculture is carried on by most scientific methods, where products are of the greatest variety, where monetary returns per acre are perhaps greater than in any other part of the world, the study of agriculture is one of the strong and popular features of the school curriculum. Several acres of the school property are generally set aside for this purpose, where students carry on their studies in the most practical way. There is also the training field of ample dimensions with grand stand and gymnasium.

* * *

School Architecture in 1916-17

SCHOOL architecture as an art made such marked progress during 1916 that this year stands out in sharp contrast to any preceding one. Several movements have, however, matured during the year to greatly advance the science of schoolhouse planning. Chief among these is the work of the co-operative committees for standardizing the essential elements of schoolhouse planning and construction. While individual and sporadic efforts had been made in former years to set schoolhouse standards with more or less accuracy, the year 1916 witnessed the leading technical, architectural and educational organizations unite co-operatively for formulating a basis to judge the efficiency of schoolhouse plans and to determine such principles of schoolhouse design and construction as are to be of lasting value.

Reports on a great number of high school buildings undertaken during the year 1916, reveal a general trend for planning in the direction of greater utility and wider use for every classroom, laboratory, etc. The buildings have generally shown a closer adherence to the introduction of small study halls, which may be used at the same time for recitation purposes and which will obviate the necessity of duplicating one-quarter or one-half of the seating capacity of buildings.

As in 1915, the most original work of the past year has been among the junior high schools. The character of these schools is altogether too unsettled to permit of the development of well defined types of buildings. Architects have generally inclined to employ high school methods and to make these intermediate schools similar in general arrangement to high school buildings, simplifying the design, the laboratories, etc., according to the best practice in elementary school design.

In elementary school buildings, there has been a wide acceptance of the one-story plan which seems to have impressed school boards, particularly in small communities, with its superior advantages for safety against fire, for flexibility in enlargement and for wider use as a social center. The one-story school has not, however, demonstrated its economy in the matter of first cost or subsequent upkeep. A good deal of mis-information has been spread and it is doubtful whether the one-story type of building will be permanent or lastingly satisfactory. The top-lighting which has been adopted has the disadvantage of giving a shut-in feeling without any improvement in the actual lighting.

There has been a noticeable decline in the propaganda for various so-called "new" ventilating systems originated by "fresh air" and "cold air" enthusiasts. The panaceas proposed have somehow failed to work out in practice because the schemes have been as impractical as their inventors. Coincident with this subsidence of clamor on the part of cranks, there has been a rather sturdy growth of the opinion that schoolroom ventilation can be satisfactory only when the air is correct in temperature, humidity, frequency of change and cleanliness. The experiments of the New York Ventilating Commission have verified this opinion.

While definite figures are not available, there are reports from many states that school heating and ventilating plants in old and new buildings have been greatly improved in the direction of more carefully designed layouts, ducts and fans, humidifiers and temperature regulators, etc.

There seems to be a very definite improvement in the attitude of the school authorities toward the careful operation of school heating plants and more skillful service in operation on the part of janitors and engineers. Where such improvement has been noted, there has been a corresponding change in the attitude toward mechanical heating and ventilating.

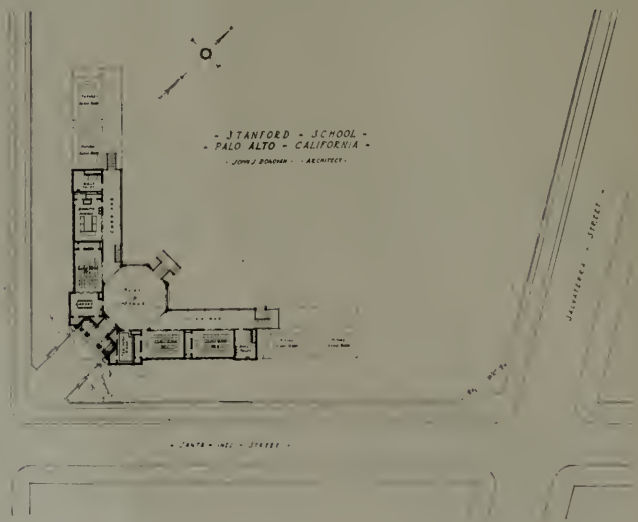
The tendency toward fireproofing school buildings has not been so marked during the past year as it was in the previous year. The greatly increased cost of materials has, perhaps, had a tendency to cause architects to seek less costly methods of construction. It cannot be said, however, that there has been a setback in the general appreciation of the value of fireproofing and of the special desirability of making doors, stairways and means of exit non-burnable.—School Board Journal.

* * *

City Planners to Convene

The Fourth California Conference on City Planning will be held at Santa Rosa, September 25 to 27. Among the speakers will be Governor William D. Stephens, Mr. Max Thelen, president of the California State Railroad Commission; Archbishop Hanna, Mr. Albert L. Stephens, City Attorney of Los Angeles; Hon. Matt I. Sullivan, former Chief Justice of the State Supreme Court; Senator S. C. Evans of Riverside, Mr. J. J. Jessup, City Engineer of Berkeley, and Mr. C. H. Cheney, City Planning Expert of San Francisco.

STANFORD DISTRICT SCHOOL, PALO ALTO
John J. Donovan, Architect



The Relations Between School Boards, their Superintendents and the Architect

By JOHN J. DONOVAN, Architect*

I COME before you as an architect with a keen appreciation for his profession, coupled with a profound respect for the educators of our country. From my varied experience in the design of school buildings, I realize, perhaps more than a great many, how badly you are handicapped in your great work by improper housing.

The school building problem is most intricate and complex, with many conflicting requirements which demand their proper adjustment, and the fullest possible co-operation between educators and architects. It is with a sincere desire to help in some measure to bring about such co-operation that I present this paper.

Before taking up my subject, I wish to lay before you a few statistics gathered during the month of May of this year from state and city school superintendents of most of the states and over fifty cities of the United States. These statistics are somewhat astounding in showing the growth of enrollment in our schools.

The increases in high school enrollment for the past eleven years varies from 34.5 per cent for the State of Maine to 435 per cent for Utah, and for the past five years from 13.81 per cent for the State of New Jersey to 179.3 per cent for West Virginia.

The elementary school enrollment in eleven years has increased from 4.7 per cent in Illinois to 200.5 per cent in Virginia, and for the past five years from 2.19 per cent in South Dakota to 80 per cent in Virginia.

Cities in general show a decided increase. The high school enrollment for cities for the ten years previous to 1915 show a variation from 21.8 per cent for Lincoln, Nebraska, to 262 per cent for Spokane, Washington, and for the past five years range from 22.8 per cent for Buffalo, New York, to 122.3 per cent for Newark, New Jersey.

The elementary school enrollment in cities has varied in eleven years from 1.5 per cent decrease in Portland, Maine, to 78.6 per cent increase in Spokane, Washington, and in the past five years from 16.4 per cent decrease in Burlington, Vermont, to 38.1 per cent increase in Cleveland, Ohio.

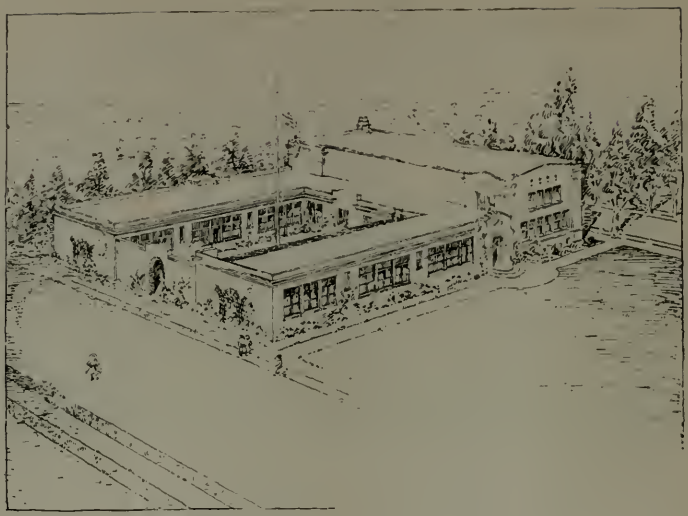
My own State, California, shows an increase for the past eleven years for high schools of 293.4 per cent and for the past five years 114 per cent, while the elementary schools have increased in eleven years 48.3 per cent and in the past five years 25.6 per cent.

The city of Oakland, California, where most of my work has been done, shows an increased high school enrollment in eleven years of 203.2 per cent and in five years of 75.5 per cent, while the elementary schools show 52.3 per cent increase in eleven years and 22.3 per cent in the past five years.

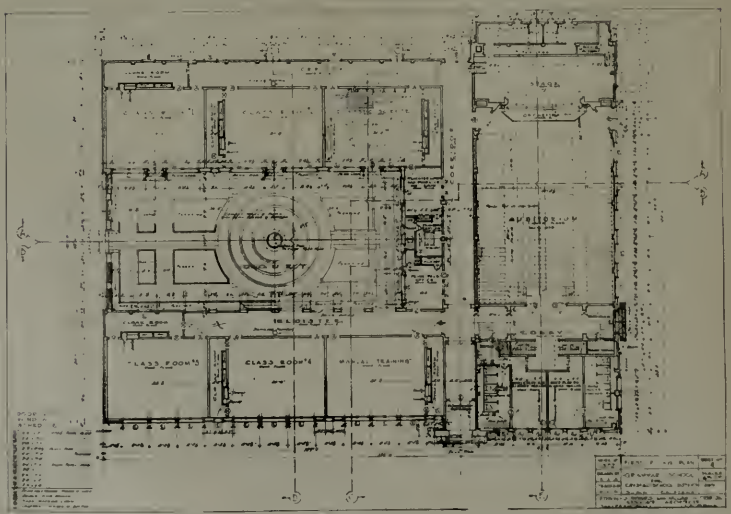
The United States Bureau of Education has published a report of the State School Systems for the year ending June 30, 1914, listing the enrollment for several years and the amounts of moneys expended. From this report we learn that the enrollment for 1914, the last recorded, between the ages of 5 and 18 years, was 20,200,153 and the average daily attendance was 14,216,459. Also that expenditure for sites, buildings and equipment for 1914 was $91,660,460, and that the estimated value of public property used for school purposes was at that time $1,444,000,850.00.

I trust I have not tired you with these figures, but my object in seeking this particular information and presenting the data to you is to point to the

*Paper read before the National Education Association July 11 1917 at Portland Ore



GRAMMAR SCHOOL FOR CRYSTAL SCHOOL DISTRICT
Edwin J. Symmes and Wm. H. Crim, Jr., Associate Architects



FIRST FLOOR PLAN, GRAMMAR SCHOOL FOR CRYSTAL SCHOOL DISTRICT
Edwin J. Symmes and Wm. H. Crim, Jr., Associate Architects

WASHINGTON GRAMMAR SCHOOL, REDWOOD CITY
N. W. Sexton & Company, Architects

WASHINGTON GRAMMAR SCHOOL, REDWOOD CITY
N. W. Sexton & Company, Architects

LINCOLN GRAMMAR SCHOOL, REDWOOD CITY
N. W. SEXTON & COMPANY, ARCHITECTS

DETAIL ENTRANCE, LINCOLN GRAMMAR SCHOOL
N. W. Sexton & Company, Architects

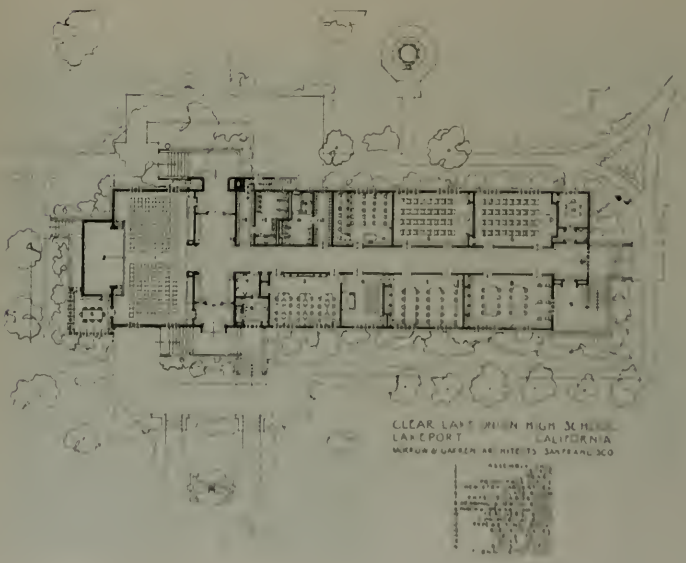
tremendous expenditure in moneys yearly for school buildings, grounds and equipment and to show the very rapid increase in the enrollment in our schools which makes it likely that within ten to fifteen years the number of school buildings will have to be double that of the present time; also to point out in this paper the necessity for the practice of wise economy and the elimination of waste and duplication by earnest collaboration between boards of education, the superintendents of schools and the architects who design the buildings.

There has been a marked improvement in the design and planning of school buildings during recent years. As methods of education have changed, the architects have in many instances risen to the occasion and the new buildings show many improvements in freedom and openness of circulation, provisions for safety, sanitation, heating and ventilation, and for the accommodation of the many rapidly developing departments such as those for vocational work, physical training, music and kindergarten. Modern educators

GRAMMAR SCHOOL, WOODLAND, CALIFORNIA
William H. Weeks, Architect

GRAMMAR SCHOOL, WOODLAND, CALIFORNIA
William H. Weeks, Architect

CLEAR LAKE UNION HIGH SCHOOL, LAKEPORT, CALIFORNIA
Morrow & Garren, Architects



CLEAR LAKE UNION HIGH SCHOOL,
LAKEPORT, CALIFORNIA
Morrow & Garren,
Architects

CLEAR LAKE UNION HIGH SCHOOL,
LAKEPORT, CALIFORNIA
Morrow & Garren,
Architects

OROSI UNION HIGH SCHOOL, TULARE COUNTY
Ernest J. Kump, Architect

WASCO UNION HIGH SCHOOL, KERN COUNTY
Ernest J. Kump, Architect

UNION HIGH SCHOOL, RIVERDALE, FRESNO COUNTY
Ernest J. Kump, Architect

EL DORADO SCHOOL, STOCKTON
Stone & Wright, Architects

WINDOW BALCONY

DETAIL OF ENTRANCE

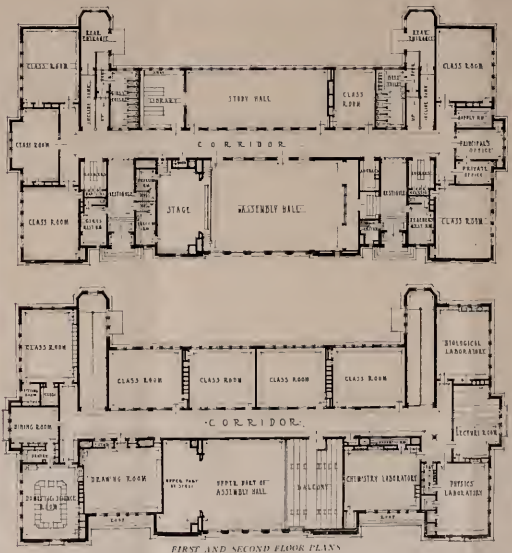
HIGH SCHOOL BUILDING

Watsonville, California

William H. Weeks, Architect

PLATE I.
The Architect and Engineer of California
September, 1917

MAIN FACADE



FIRST AND SECOND FLOOR PLANS

COLONNADE OF WINDOWS

HAWTHORNE GRADE SCHOOL, EAST SAN JOSE
Frank D. Wolfe, Architect

VIEW OF COURT FROM CLOISTER HAWTHORNE SCHOOL, EAST SAN JOSE
Frank D. Wolfe, Architect

TOWER, LOS ANGELES HIGH SCHOOL
JOHN C. AUSTIN, ARCHITECT

HIGH SCHOOL BUILDING, LOS ANGELES
John C. Austin, Architect

recognize the fact that proper provisions for recreation are essential to obtain the best results from the student and architects have been called upon to devise play rooms, lunch rooms and gymnasiums, as well as rooms for the many student activities, such as club rooms, newspaper rooms, wireless and photographic rooms, etc.

To obtain directness and freedom of circulation and such a correlation of departments as to save all unnecessary steps, as well as to save all waste space and needless expense, requires a simple and often a bold handling of the plan. This can be accomplished only through an intimate knowledge of the workings and requirements of the school. The greater the architect's knowledge of these matters, the happier the results will be, but in any case he should hold the fullest possible conference with those who are to occupy the building, as well as with experts in the various special branches from other parts of the country. No matter how wide his personal knowledge

LOW GRAMMAR SCHOOL, LONG BEACH, CALIFORNIA
Stone & Wright, Architects

and experience may be, he can always learn something of value from those who are actually using the buildings.

The fact of the matter is, we have only begun to comprehend and understand the school building problem with its many phases. The field is so wide, progress so slow, and opportunities for improvement fly so rapidly, that the period of a lifetime is too short to perfectly master the details. The wider use of the school and the changes developed by the bright and active minds within the ranks of the teaching profession are constantly opening up new lines of thought, which go far to keep the school a variable quantity and impress upon us the necessity of assigning various rooms to serve many functions, although we may standardize such rooms as class rooms, administrative office, laboratories, etc.

The research work of your Committee on Standardization, if vigorously and extensively carried out, is bound to have a marked influence on future buildings, providing the deductions and recommendations are not too abstract and unwieldy, so that the tabulated results may be easily comprehended by the layman.

Collecting this data is almost entirely an architect's problem. It is a simple but laborious one, but the correct deductions from this data and the recommendations to present to the educational world for consideration and adoption must be the joint work of the educators and the architect. Let us take one or two concrete examples to illustrate this point: Our committee undoubtedly will present drawings showing class rooms worked out economically for both high and elementary schools, giving the right dimensions for various seating capacities. They will take up the size of science laboratories, giving correct sizes for these rooms for certain fixed enrollment in science work and indicating what increment in size is required for additional numbers.

Now the dangerous side of this standardization work is worthy of consideration, and all this data is as likely to prove dangerous as it is advantageous, unless its use is accompanied by intelligence and understanding; and herein lies the opportunity for good team work between the school superintendent and the architect, for it will require the intelligence and ability of both to be able to select from the data which is presented that which is applicable to the problems. I hope the day will never arrive when any committee will attempt to standardize other than parts or units of a school; for to encourage a standard type of school to be scattered broadcast throughout the country would aid and abet some of the wretched work so characteristic of the pausity of imagination exemplified on many of the late periods of American architecture, particularly in a great deal of our present school architecture. Therefore, I take it upon myself to sound this word of warning in order that the work of the Committee on Standardization of Schools and their parts may be taken and used for the exact value it possesses and for no more; and that value will mean much towards economy, sensible design in our school buildings and avoidance of a great deal of waste.

Although the progress in school architecture has been marked, the general results are yet far from satisfactory, and you have a right to expect far greater progress in the future than has been shown in the past. Our schools should be examples to the country of efficient and economical planning and design, with a chaste and inexpensive beauty obtained through pleasing proportions, and a pleasing use of materials and color rather than through the use of ornamentation or useless accessories. They should do their part in educating the parents as well as the children to a proper appreciation of

true beauty and true architecture. Each school should possess an individuality of which the community and the public may feel proud.

Now for the relationship between boards of education, their superintendents and the architects: I have spoken of the necessity of collaboration between the school superintendent and the architect; this needs little or no comment. It is absolutely necessary, for the architect who will design a school building without the unlimited help, advice, criticism and suggestions of the superintendent will, undoubtedly, have as poor a misfit to his credit as the superintendent who might attempt to design a school building without the services of the architect.

The fine creation, the big result and the solution of each such problem, whether large or small, calls for the best in both men and for a freedom of discussion of the points pertaining to the work, so that the final solution belongs to both and both should be proud of the work and unselfish in sharing the credit. This is the spirit which, if furthered and promoted between these two important officers will mean much for education.

What is true for the superintendent and architect is just as true for the board of education and the architect. To bring this about the board's first province lies in the selection of the men to perform its work and, since I am far enough away from home, I may touch upon this delicate subject with impunity. In the first place, for a man to be a good architect, he must have self-respect, minus conceit. If he has that, with both the algebraic signs in the right places, at least the board has made a good start. These characteristics will assure honesty, not only with your board, but with the contractors and the workmen, and he will prove an impartial judge in deciding important questions arising between the board and their contractor.

And let me say here, that the architect who will act unfairly with a contractor in demanding that which is not specified or which is vaguely or indefinitely suggested either to cover up his own incompetency or to create a good impression with his clients is unmoral and dishonest. Therefore, your board should select men of training and ability in the work. I firmly believe that school architecture is a specialty in the practice of architecture just as surgery is a specialty in the practice of medicine. A man to be qualified for the work requires not only a broad understanding of the school and its duties, but also must be heartily in sympathy and in accord with it and have a keen appreciation for the work of the various teachers. He should be able to place himself in their position and view it entirely from their viewpoint. To be qualified to do school work, an architect must necessarily have a liberal and technical education, as well as experience in school work and a knowledge of school methods and requirements.

A board should select a man because of his work, rather than because of some clever picture he may draw. If an architect is fully competent to perform school work and his work proves pleasing to the board, he should be selected without competition and the problem should be studied out with him rather than to ask a number of architects to submit competitive schemes without the opportunity to collaborate with the board and with the school superintendent.

Just a word on the mutual confidence between boards of education and their architects. There should be nothing known to the one which is not known to the other. The confidence existing between them should be that of the family. Without it, miserable results in execution are bound to follow. It behooves the board to stand right back of their man in all of his efforts and it behooves the architect to stand up for the rights and interests of the board. He should be the first to advise them of an error on his part

and he should always be man enough to admit it, and not conceal it at the expense of the contractor or by a compromise which may mean a direct loss to his clients either in workmanship or materials. If this is done, the board is in a position to correct the error and the slate is kept clean with both board and architect free in conscience to solve each and every new problem on its own merits.

In return for the ethics, the competency, the desire to co-operate and devotion to this special work, the architectural profession has a deep and serious request to make to all boards of education, and they would ask that they hearken to that request for the mutual welfare of both, but especially for the general good and benefit to the schools. That request is that the boards of education adopt and adhere to a code of ethics in selecting an architect for their work.

The American Institute of Architects frowns upon competitions in general, and censures and penalizes its members who may take part in unauthorized competitions. This has proven to be a wise policy, favorable to the members of the profession, in that it protects them against the cheat, and favorable to the public in that it protects it from being cheated, and protects the man of ability from flagrant misrepresentations and favoritism. The Institute recommends that its members be chosen for work of this character just as you would select an attorney or a surgeon to render their respective services. The men of standing will not enter into a wild scramble for this work, submitting sketches, individual estimates and log-rolling for commissions. Neither will these men compete by cutting rates or by other unprofessional tactics.

The Institute recognizes and steadfastly advises that a client is almost at the mercy of the architect who unscrupulously solicits work; while the man of standing has much at stake in performing every piece of work. Each production of the architect's office is closely followed by his confreres and, unless each building is an improvement over the preceding one, he suffers in standing and in the good opinion of members of the profession. Therefore, he cannot afford to slight even the smallest of his commissions if he wishes to be successful and to maintain an established success.

I wish to call your attention to the fact that the proper selection of an architect is one of the very best investments a board of education can make. For can he not, by a single act through carelessness, bad judgment or, worse yet, by dishonesty, cause to his clients a loss greater than his total fees?

Generally, it will cost little or nothing to consult with the men of the Institute for advice. In this respect, you will find them most generous to direct you correctly and it is a good thing to do this before undertaking the raising of money by bonds or taxes for new work. You will find that the architects will go much further than to render advice, for if a board directly employs an architect to assist them in obtaining a comprehensive scheme and estimate before calling for bonds, with an agreement that he is to be their architect when the work goes ahead, this service will be rendered for a very nominal charge and you will have a splendid basis upon which to start your building work.

We wish to impress upon you our desire to deal fairly and freely with you, to give you the best of our talent, judgment and experience. In return, we ask your co-operation in lifting this important feature of your duties out of the quagmire of sharp trading and political log-rolling. You and your people are the gainers by it and your finished work will show a dignity and charm when done on ethical lines.

In conclusion, I beg to say that with the tremendous expenditure of money which necessarily must be made in the succeeding decades, a great economy will be exercised by selecting men to perform your architectural work who have the interest of the school at heart, who desire to make each building an asset to its community, and who will go to no end of thought, study and labor to avoid and eliminate waste; for, as Dr. MacLaurin has well said, the training of technical men is such as to lead them to look naturally for means of saving waste so that waste becomes a hateful thing in itself and men will put forth their best energies to avoid it.

* * *

Los Angeles Chapter, A. I. A. Resumes Meetings

AT THE September meeting of the Southern California Chapter, American Institute of Architects, Mr. Alfred F. Rosenheim led an interesting discussion on the subject of advertising in which most of the members present participated. It was the consensus of opinion, expressed by a motion adopted by the Chapter, that legitimate publicity is not in conflict with the code of ethics of the Institute and that members are free to obtain and profit by it whenever possible. Paid advertising is not permitted under the code of ethics of the Institute.

Mr. John P. Krempel, chairman of the committee on revision of the by-laws of the Chapter, reported that the committee would make a report at its next meeting. The State of Arizona has been included in the jurisdiction of the Southern California Chapter by the Institute and the by-laws will be drawn to permit the admission of architects in that territory to membership.

Mr. H. F. Withey, chairman of the committee on city planning, reported that the proposed ordinance creating a city planning commission is still in the hands of the City Attorney, who has expressed informally the opinion that the ordinance in its present scope is too drastic and is properly a matter to be taken care of in the city charter. The City Attorney has intimated that he will report adversely on the ordinance, but the committee will not abate its efforts to secure favorable action upon it.

A communication was received from the secretary of the Institute announcing that Mr. C. M. Winslow of the New York Chapter, and Mr. R. G. Hubby of the Cleveland Chapter had been assigned to membership in the Southern California Chapter. Mr. Winslow has been engaged in practice at San Diego and Los Angeles for several years and Mr. Hubby came to Los Angeles recently and is located in Hollywood.

The following members were present at the meeting: Messrs. J. E. Allison, J. C. Austin, J. J. Backus, F. Pierpont Davis, A. M. Edelman, Percy A. Eisen, W. E. Erkes, R. C. Farrell, Lyman Farwell, Elmer Grey, Frank Hudson, John P. Krempel, A. C. Martin, S. Tilden Norton, Robert H. Orr, A. F. Rosenheim, W. J. Saunders, John T. Vawter, August Wackerbarth, A. R. Walker, H. F. Withey, J. Constantine Hillman, S. B. Marston, R. G. Hubby and W. H. Wilson.

* * *

And It Makes Father a Bear

"Pa, why is the man's room in a house called a 'den'?"

"Because it is occupied mostly by the mother and cubs."

ENTRANCE, EDISON SCHOOL BUILDING, BERKELEY
W. H. Ratcliff, Jr., City Architect

Necessity of Adaptation of Building to School Organization*

By S. A. CHALLMAN, Commissioner of School Buildings for Minnesota

THE conditions of today both as to forms of school organization and economy of construction of school buildings are much more complex than they were less than ten years ago. Even the small elementary school building which at one time consisted almost wholly of a number of school rooms of uniform size opening from a common corridor is as antiquated today as the one-cylinder automobile, though not so rare. High school

*Paper read before the Department of School Administration, National Education Association Convention, Portland, Ore.

buildings have undergone such a transformation that comparisons are well-nigh inapt, and it is difficult to make even a satisfactory classification of the different types that have been evolved. Variations occur constantly and many buildings merge the features of one type into those of another.

We recognize today that all schools, whether elementary or high, must provide not only for the intellectual needs but also for the physical development and the industrial training of the children, as well as the social activities of the community. This implies for elementary schools, class rooms and wardrobes, play rooms or gymnasiums, which may also be used for community purposes, kindergartens, lunch rooms, showers, swimming pools, open air rooms, and in each case a nurse's room, a principal's office and a library. For the high schools it means not only study rooms, recitation rooms and laboratories, administration rooms, but also shops, rooms for home economics, cafeterias, commercial departments, art departments, music rooms, auditoriums, gymnasiums, and other rooms for recreation purposes.

To provide in each case the most convenient interior arrangement with a proper amount of floor space for the number of pupils who can most advantageously occupy the rooms at the same time is a task of no mean proportion. But when, added to this, the architect must also adapt the plans to some particular form of school organization, the special problems which arise complicate the situation. In view of the extensive educational programme to which we are committed and the limited financial appropriation to which we are generally restricted, the adjustment which must necessarily be made taxes the ingenuity of every conscientious architect.

But these problems have had their beneficial results. We are now better prepared to eliminate waste in floor space, agree upon certain reasonable standards as to rooms, and insist upon a declaration of educational policies as to the daily use of the various rooms of a school building. We have already begun to reduce the width of corridors, standardize the width of stairs and exits, limit the number of sittings in rooms used for study and recitation by fixing the capacity of the room as to number of pupils, determine the amount of space needed for each pupil in laboratories and shops, and adjust the sizes of industrial rooms to the number of pupils who can be conveniently instructed at one time. We have also come to realize the necessity of determining the number and size of accessory rooms which would add to the efficiency of each department, and we are gradually learning that for schools of various sizes we should incorporate such features only as are vital to the school organization.

In all elementary schools the class room is naturally the unit which governs the general features of the building. The number of such rooms, with adjoining coat rooms, will determine the width of corridors, the number and location of stairways, the size of play rooms, lunch rooms and other rooms for administrative and social purposes. In a building of not more than eight class rooms a general assembly room may be secured by connecting two school rooms separated by a movable partition. In larger buildings an auditorium or a combination of an auditorium and a gymnasium is virtually a necessity both for school and community purposes.

In high schools four generally recognized forms of school organization affect the planning of the interior arrangement. These are all based upon the provision for seating pupils for purposes of study and recitation:

1. The familiar plan by means of which pupils are seated in one or more large assembly rooms used primarily as study rooms, presided over by a principal or teachers in rotation as their recitation periods will permit. All recitations are then conducted in special rooms assigned to the various

COLUSA GRAMMAR SCHOOL, COLUSA, CALIFORNIA
William H. Weeks, Architect

UNION HIGH SCHOOL, TRACY, CALIFORNIA
William H. Weeks, Architect

teachers of the high school corps. This form gives to each pupil in attendance the same seat where he is expected to be studying during school hours when not otherwise assigned.

2. The well-known plan of providing small study rooms to seat from fifty to seventy pupils and using these rooms for recitation purposes in connection with auxiliary recitation rooms. These study rooms are in charge of a room teacher whose recitations are all conducted in the room assigned to this teacher. Each pupil secures by this arrangement a seat which he retains most of the time, when not reciting in another room, except when classes having recitations in this room make it necessary for him to vacate his seat, especially in the front part of the room.

3. The more economical plan which provides seats in study rooms for about 40 per cent of the pupils of the school and still has the usual number of recitation rooms. The idea underlying this plan takes cognizance of the fact that about two-thirds of the pupils are reciting in their classes during each period of the day and only those who are not attending recitations are provided for in the study rooms. By this plan a pupil selects any vacant seat he may find in the study room and is not expected to reappear on each succeeding day in any particular seat.

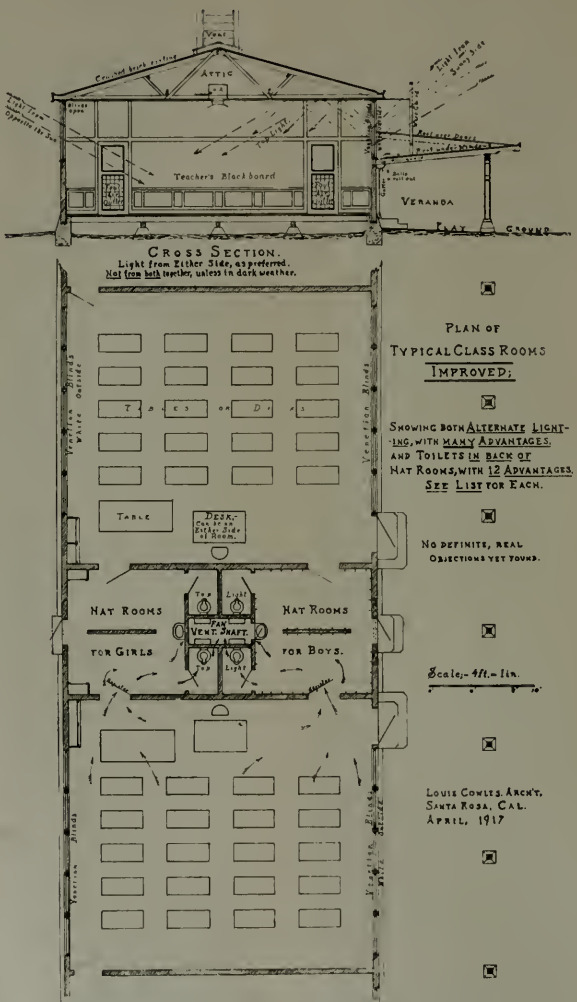
4. The more recent plan of combined study and recitation room, according to which pupils pass from room to room during the day and occupy seats for purposes of study in the rear of any room which affords an opportunity for study. In actual practice the plan gives to each pupil a definite seat during each period of the day and he is expected to arrange his programme in such manner that he may be found at his accustomed place from day to day.

The first of these plans requires the largest building and the largest annual cost of maintenance. The last, the smallest building and the most economical outlay for maintenance. As to advantages from a pedagogical standpoint, these are debatable. The first type has a study room which during the regular recitation periods is occupied only to about one-third of its capacity. It is, however, quiet during recitation periods and affords opportunities for undisturbed study. The second, as well as the fourth type, make it necessary for pupils to concentrate their attention on their studies while classes in other subjects are reciting in the same room. The third type gives the same opportunities for study as the first, but gives seating capacity only to the number who are not actually reciting at each period.

Considering only the academic work with which the school organization is primarily concerned and making a careful estimate of the amount of floor space required per pupil for each type of building, including outside walls, partitions, corridors, coat rooms, libraries, laboratories, recitation and study rooms, the amount in square feet per pupil for each type would approximate 52 for the first, 47 for the second, 45 for the third, and 42 for the fourth.

In laboratories and departmental rooms the maximum size of each group which is to carry on its work at the same time should first of all be determined. The type of equipment should then be considered. With these two factors in mind, the size and shape of the room best adapted to the work that is to be done can be readily ascertained. The difficulty in most cases is that neither one of these factors is definitely settled in advance of the drawing of the plans, and as a result many such rooms are unsatisfactory, when put to the test of actual use.

In order, therefore, to work out a satisfactory plan, it is essential that the superintendent of schools prepare a schedule, outlining the various rooms needed and the specific features to be incorporated. With this must go a descriptive outline of the school organization, so that the architect may be able to arrange rooms and fix sizes of rooms to advantage.



PLAN OF
TYPICAL CLASS ROOMS
IMPROVED;

SHOWING BOTH ALTERNATE LIGHTING, WITH MANY ADVANTAGES, AND TOILETS IN BACK OF HAT ROOMS, WITH 12 ADVANTAGES. SEE LIST FOR EACH.

NO DEFINITE, REAL OBJECTIONS YET FOUND.

ALTERNATE LIGHTING PLAN FOR SCHOOL ROOMS
LOUIS COWLES, ARCHITECT

An Alternate Lighting Plan for School Rooms

MR. LOUIS COWLES, a Santa Rosa architect, is the author of a lighting plan for the school room which has many practical advantages, and his diagram on the opposite page will be found replete with good suggestions.

The plan was worked out by Mr. Cowles as part of his studies for new schools in Santa Rosa, the lighting scheme being intended primarily for the Fremont school in that city. In its main essentials, however, the idea is applicable to any building. The author has summarized the advantages to be obtained by his method of alternate lighting by windows on both sides of the class rooms (using either side alone as a rule and no cross lighting) as follows:

1. Rooms can have "north light" (opposite the sun) all day long, by simply closing sunny side and opening the other, reversing about noon, or whenever the sun changes sides.

2. If preferred they can have sunshine all day long, reversing at noon (tempering glare by Venetian blinds).

3. If wanted any time, as in a dull day, they can have both together—any adjusted amount of each, without "cross lights," by deflecting one to the ceiling first—using as "top light," indirect, mellow.

4. Any desired amount of cross ventilation—"fresh air" can be used.

5. Blackboards can be had on all four sides of rooms, the teacher's longer.

6. On a very dark, cloudy day, if wanted, both sides fully open will give more light than either side alone with long windows, yet without real "cross lights" in the injurious sense; all light then is subdued.

7. Lighting both sides allows rooms to be set the short way in the row; row is then shorter and results in better spaces for running in front (or other purposes).

8. Also gives a good width book room, etc. (used as well for dressing room).

9. This also allows a good lunch room, etc.

10. The dense shade of trees on the east and the nearness of two houses on the west, would badly interfere with lighting if on those sides only. But by this plan, with both sides available, plenty of light is had.

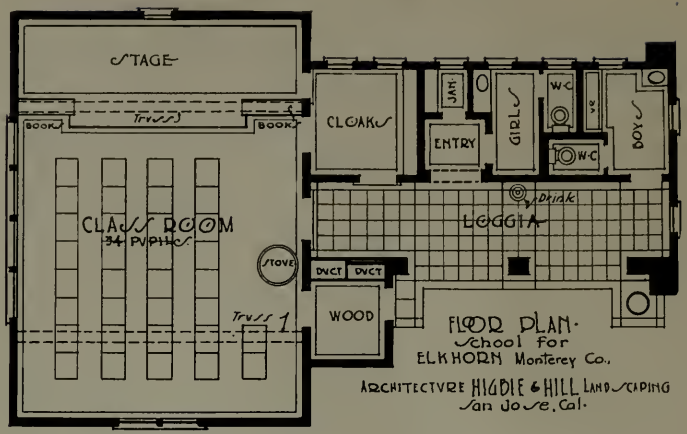
The north row of rooms on 5th street, if lighted only on north side, would get no "sun" at all in school hours; but by this plan would have all the sun desired, without "cross lights,"—diverting it to the ceiling first as wanted.

No essential values or especially desirable features in the "standard room" are lost or ignored. No variation from usual practice is proposed without first knowing the reason why any value is there and providing for it in the improved plan.

Classroom proportions while different are not at all bad, and if desired can, at slight expense, be made more beautiful by thin strips of wood on the ceiling in a simple nice design (see diagram). Any one room or all can be so treated at little cost.

Cost of building as shown (plain ceilings), with short windows both sides, would be about the same for class rooms as with "standard rooms." Several items costing less, being about offset by small increases.

Also, the pupils in the rear are nearer the teacher's desk, hence are more under her influence. They can also see the work on her blackboard better, especially if they have defective eyes, as so many children have.



The One Room School Building

THE above plan for a one-room suburban school building has the approval of the California State Department of Education as meeting the requirements for sanitation, convenience and beauty. It is published at the suggestion of a San Francisco architect, who thinks some of our school educators need some instruction along architectural lines. He cites an instance of a district board employing a contractor to plan and build a one-room schoolhouse for $1500. The architect stumbled upon the plan just in time to save the district from having a building with girls' and boys' toilets in the back yard, a distance of 30 or 40 feet from the school—a pleasant prospect for the sensitive pupil in stormy weather. The architect suggested to the contractor that he put the toilets and school room all under one roof, and the contractor admitted that would be a fine idea. He hadn't thought of it before. And then the architect added a porch and cloak room —all for the $1500.

* * *

The World's Most Useful Building

The most frequent and useful type of public building in the United States is the schoolhouse. However infrequently the average citizen may directly use the facilities of the courthouse, the city hall, the public hospital, the almshouse or the county jail, hardly a man or woman but has enjoyed as a child or adult the privileges and benefits of the school.

All this may sound trite and commonplace; but when it is remembered that there are in the United States 276,460 schoolhouses, valued at $1,444,666,859, and that each year more than eight thousand new schoolhouses are built, at a total expense of nearly seventy million dollars, some idea of the purely monetary importance of school buildings may be had. If it is further remembered that in these school buildings some twenty-one million young Americans are being prepared for citizenship and life, and that the health and future efficiency, as well as happiness, of these children are vitally affected by the arrangement, safety and sanitary character of these school buildings.

Some Standards for the School Builder

By WM. C. BRUCE, in the National Builder

FACADE, SUNNYVALE SCHOOL
F. D. Wolfe, Architect

DURING the very recent past, experts in various fields—hygienists, domestic engineers, and specialists in safety and fire prevention— have brought their knowledge to bear in improving each new school structure; and the sum total of all experience has been expressed in many states in minimum legal requirements to make schoolhouses most useful, safe and economical—in a word, to standardize them.

The unit of all school organization is the class, which, roughly, is a group of children pursuing identical or similar studies under one teacher. In the country or village school, the class may consist of children in two or three, or even all the eight grades; but so far as general methods are concerned, the children form a single group-unit. The designer of a schoolhouse must consider the class the basis of all planning; and he may well begin with the class room which will comfortably accommodate the class unit as the basis of his entire structure. It has been well established that forty children form the maximum number which one teacher can teach advantageously, and this number is commonly taken as the factor in determining the number of classrooms to be provided.

Observation of many schools, under many conditions, has established the fact that the space for each child in a class must not be less than 18 square feet of floor surface. The ordinary desk takes a space 16½ by 23 or 24 inches, and aisles between desks must be not less than 18 inches wide. Along the windows and along the blackboard, the space must be from 2 to 3 feet wide, and between the front row of desks and the wall behind the teacher's desk there must be a space of 5 to 8 feet. Observation has shown that the classroom which is more than 24 feet wide and less than 12 feet high, will not permit of sufficient window surface so that the seats nearest the inner wall will receive a necessary minimum of light for comfortable study. It has been proven by experience that a room which exceeds 32 feet in length makes it necessary for both teachers and pupils to talk in a tone which quickly produces fatigue and interferes with the ordinary conduct of the school. School authorities, therefore, agree that the maximum size of the classroom shall be 24x32x12 feet for forty children

Under most circumstances, window surface of not less than one fifth of the floor surface in the room is necessary. On the north side and on shaded exposures, the proportion of actual glass area should be one to four. The windows will perform their duty most effectively if they are arranged in a solid bank on the long side of the room, with square heads and the narrowest

mullions which the construction will permit. The windows should be set 3 feet 6 inches above the floor and extend to a line 6 inches from the ceiling. The light must all come from one side, from the left. Windows at the rear, or on the right of the room, are always bad and must never be permitted.

The ordinary trim of the classroom will be most satisfactory from a hygienic standpoint if it approaches hospital trim in type and material. The floors are best covered with hard maple and fitted with a sanitary cove at the wall connections. Wood moldings should be severely plain and may even be omitted from windows in favor of a metal bead, set flush with the plaster and painted. The walls are best plastered and painted with a flat or eggshell paint in a light gray, green or tan color. Slate is the standard blackboard material but composition board of a guaranteed brand is quite as satisfactory. The classroom door should be placed near the front of the room. It should be absolutely plain, not less than 3 feet 7 inches wide, and should swing out.

An essential adjunct to every classroom is a coatroom or wardrobe for storing the clothing of children. This is most serviceable when it is placed at the teacher's end of the room, with two cased openings from the classroom. It should be not less than 4 feet 6 inches wide, and should be 23 or 24 feet long.

The greatest difference in practice exists in the arrangement and location of stairs and corridors. In two and three-room buildings, corridors must be not less than 8 feet wide, and in four-room and larger buildings a width of 12 feet is standard. While there is much merit in the so-called compact arrangement of schools, there is much to be said for plans which permit the lighting of corridors for their greater length by windows. The corridors can then be made bright and can be adequately decorated with pictures.

The closed or box type of stairs, built of fireproof material and set in fireproof walls is to be preferred to every other type. They should invariably be placed adjacent to an outside wall so that direct exit is afforded. Children may use them most conveniently if the risers are not more than 6 inches high and the treads not more than 10 inches wide. Each stair should be broken midway between floors by a landing that is no narrower than the width of the stair. A width of 4 feet, or 4 feet 6 inches, is ordinarily accepted as standard, and one stair is provided for every 150 children above the first floor.

As a rule, buildings containing two or more classrooms require at least two exits. Pockets and obstructions of all kinds are to be avoided in vestibules and exit corridors. The doors must swing outward and should be equipped with anti-panic bolts.

Every modern school now requires a certain number of so-called special rooms. With a growing acceptance of the idea that the school should be the place for alternate study, work and play, the shop or workroom is almost as essential as the ordinary classroom. Even in one-room country schools, there is hardly an excuse now for not providing space for manual training, agriculture and household arts. While this short paper cannot discuss in detail the size or equipment of such shops, it should be said that they should be given due consideration in arrangement, location in the building, and equipment. While there is no objection to placing the manual training and domestic art rooms in the basement or ground floor, they should be amply protected against dampness and should be well lighted and thoroughly ventilated.

No schoolhouse larger than one room is complete without a small room in which to house the school library. In the high schools, this room may well be of sufficient size so that it can be used for reference and study purposes.

The modern school building can hardly be said to fully meet its opportunities if it does not contain an auditorium in which the children may be assembled periodically for general exercises and in which class plays, graduation exercises and similar activities take place. In buildings of four rooms and less, a folding partition may be arranged between two classrooms so that these will serve as an assembly room.

In larger elementary schools, the auditorium will be sufficient in size if it affords seating room for one-half the total number of children. In high schools, it should seat the total student body. An auditorium of this size, according to experience, will be large enough for all neighborhood gatherings and for meetings to which the people of the district are invited. Small assembly rooms which seat less than two hundred persons may be planned with a flat floor and may serve the double purpose of a gymnasium.

In addition to the sanitary precautions taken in the construction, no schoolhouse of more than two rooms is adequately equipped with sanitary devices unless it has a system of water closets of the best school type. There is hardly an acceptable excuse at the present time for not employing a sanitary water system for drinking and other purposes. Sewage disposal systems are so simple and readily installed that they become a part of any rural or village school which has no regular sewer connections.

In average two-room and larger buildings, one closet is required for every 15 girls and one closet and one urinal for every 25 boys. The closet stalls are usually 2 feet 6 inches wide and 3 feet 6 inches deep. The partitions are 3 feet 6 inches to 4 feet high, and the doors are set 18 inches above the floor. Ample daylight is essential in all toilets.

In rural schools containing one room no better method of heating and ventilation has been found than the jacketed stove, which is now manufactured by a considerable number of firms and may be had at only a slightly higher cost than the old-fashioned wood burner. In buildings of two or three rooms, the basement furnace of approved type is quite satisfactory for heating and ventilation, but a low pressure steam or vapor system with fan ventilation is best. In buildings of four rooms and larger, the steam type of heating with fan ventilation is essential for sanitary and comfortable conditions. Space will not permit of any discussion of these proposals. It may be said, however, that no heating and ventilating plant in a school is satisfactory if it fails to supply thirty cubic feet of fresh air per minute, per child. The warm air inlets must be placed 8 feet above the floor line and the exhausts at the floor line on the same side of the classroom.

In buildings of four rooms or less, non-fireproof construction will serve all ordinary requirements, particularly if the enclosing walls are of incombustible materials and firestops are introduced at danger points in the framing.

Coincident with the movement for greater safety in construction, has been the growing introduction of one-story schoolhouses. It should be said here parenthetically that all school buildings are being limited to two stories and even in the cities where very large high schools are necessary, and where land is costly, the height of school buildings is being kept down to two or three stories. The original advantage sought in one-story school buildings is educational, in that it is believed that the elimination of stair climbing makes for better school management, obviates physical strain particularly in the case of girls, and gives a sense of security which is based upon the possibility of quickly dismissing classes into the open air at the

first sign of danger. Other educational advantages are to be found in one-story buildings, but school board members have been even more impressed with the cheap construction which is possible. Whether the one-story school will be so economical in the long run time only can tell.

The schoolhouse is becoming each year a more potent factor in the civic and social life of the adult population of our cities and towns as its possibilities are becoming understood and its facilities are used. It requires but minor modifications in the plan and equipment of a building to fit it for use as an evening school, as a social center, and as a community meeting place. It costs not a cent to arrange the school auditorium so that it may be used independently of the rest of the building at any hour of the day or night. A very small expenditure for lighting will make the classrooms suitable for evening use. The new type of movable desk chairs are especially useful for adapting ordinary schoolrooms to every form of adult activity. It is merely a matter of understanding that the schoolhouse belongs to the people and that they should use it more than four or five hours on five days of the week. There are wonderful opportunities in every schoolhouse for civic service. The schoolhouse hardly has been discovered.

The problem of planning and constructing a school building should be welcomed by every architect and builder as an opportunity for an important public service. The schoolhouse is a far more important factor in education than is commonly believed; if it is insanitary, ill-designed and unsafe, it is a harm to the children, a hindrance to the teachers and a distinct menace to the stability of the community. On the other hand, if it is useful in the widest degree, if it is safe, economical and beautiful, it becomes a valuable aid to the children, it is an inspiration and an incentive to the teachers, and a strong support to the continued prosperity and success of a city and a state. No people will begrudge any expense or sacrifice for a schoolhouse if they see in it service to their children, to themselves and to the future welfare of the republic.

* * *

Country Schools and Country Roads

NOTHING is more demoralizing to any community than a combination of abominable roads and inadequate educational facilities. In a country district having poor roads you, quite likely, will find the only schools to be one or two room shacks under a single teacher.

The school population in such a community is usually very sparse. If the roads are poor, only children in the immediate neighborhood can attend the school. In consequence, the entire burden of supporting it devolves upon the parents of these children and it is a financial impossibility, in many instances, to provide modern school equipment.

But, no matter how isolated the community, good roads are immediately followed by central graded schools. Good roads make possible the use of vehicles to convey students to the school from a wide radius of country. This, in turn, distributes the burden of taxation for the upkeep of the school over a great many more people. Thus, through a per capita tax, little, if any, in excess of what the country community had been paying for the upkeep of one and two room school buildings, educational facilities are provided which rival the most modern and complete institutions found in the cities.

The rapid growth of the community and the better ideals of citizenship inculcated by the school cause a spirit of progress. Roads are steadily improved. More and more central schools unite the people, and an old, backward, ingrowing countryside is transformed into a thriving community of thrifty, prosperous, and public spirited citizens.—Highway Magazine.

EL PASO HIGH SCHOOL, EL PASO, TEXAS
Trost & Trost, Architects

The El Paso High School

EL PASO'S new High School at El Paso, Texas, is a bold departure from ordinary conceptions of the desirable arrangement for a high school building, and its architects, Messrs. Trost & Trost, deserve praise for the balance and consistency which characterizes their general scheme as well as the merit of the details of design and construction. The building reminds one of a huge pair of dividers, opened at an angle of 45 degrees, with the classrooms strung along the arms and the auditorium at the point of connection. The architectural considerations which led to the adoption of this shape were both internal as related to the educational use of the structure, the economy of the plan, and the aspect of the rooms, and external as determined by the most advantageous use of the site for athletic as well as building purposes. The arrangement permits of the fullest use of the site, in the erection of the stadium, and will permit the future erection of additional buildings which will not interfere with the present structure or stadium.

Plans were completed in the summer of 1914, and the grading and other preliminary work in connection with the stadium was undertaken in the fall of 1914. The work of erecting the building did not begin until late in the fall of 1914, after the architects had carefully considered every detail in completing the plans.

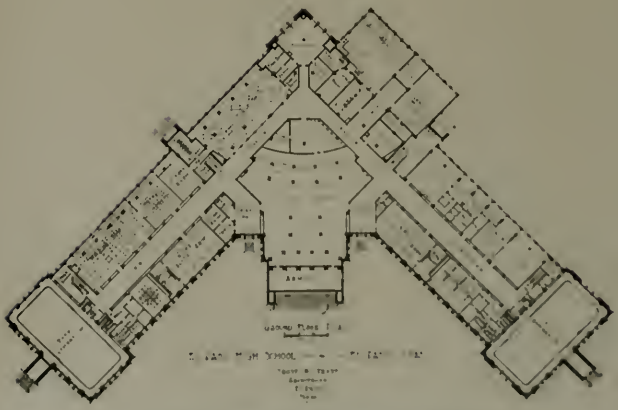
Entire building consists of four floors with a sub-basement in the rear, and under a small portion of the auditorium. This last mentioned space, which extends beyond the main walls of the building, affords room for the boilers, engines and coal bunkers.

The ground floor of the building is devoted almost entirely to shops, to the lunch room, to the gymnasiums and to service rooms. In this basement the advantages of the general shape of the building become evident. From the administrative standpoint, it is highly desirable to keep the shops, the home-arts work rooms and the physical education departments as widely separated as possible so that there can be no conflict in use. The gymnasiums which are at the extreme ends of the wings, are splendidly lighted from three sides and the windows are so arranged that cross ventilation may be had at all times. Immediately adjoining the gymnasiums there are shower and locker rooms, toilets, store rooms for physical apparatus, etc. In the girls' wing there are cooking and sewing rooms and a complete housekeeping suite. In the boys' wing there are machine and metalworking shops, forge shops, a lecture room, offices, etc. In an extension of the building,

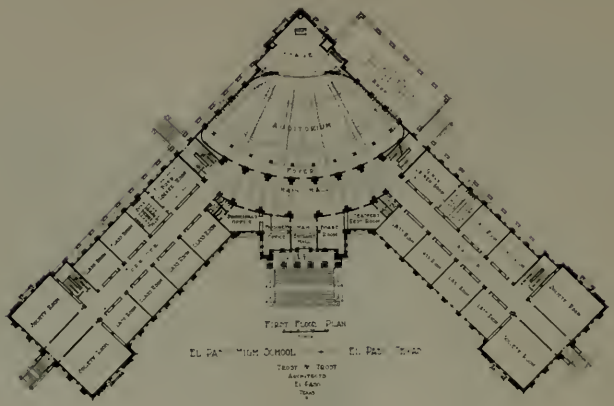
EL PASO HIGH SCHOOL, EL PASO, TEXAS
Trost & Trost, Architects

MAIN HALL, EL PASO HIGH SCHOOL, EL PASO, TEXAS
Trost & Trost, Architects

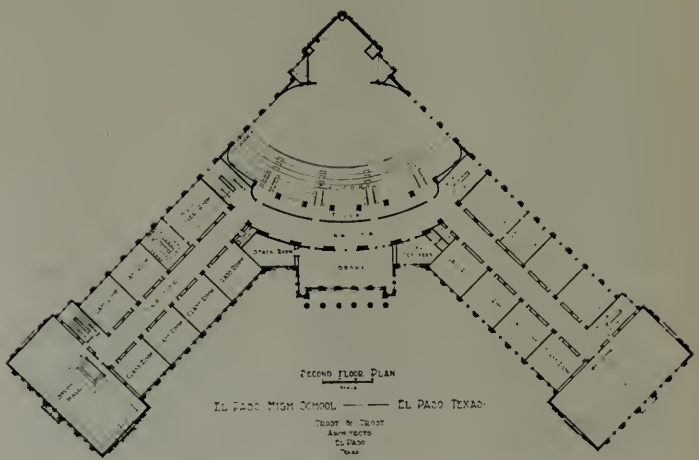
PLOT PLAN, EL PASO HIGH SCHOOL
Trost & Trost, Architects



GROUND PLAN, EL PASO HIGH SCHOOL
Trost & Trost, Architects



FIRST FLOOR PLAN, EL PASO HIGH SCHOOL
Trost & Trost, Architects



SECOND FLOOR PLAN, EL PASO HIGH SCHOOL.
Trost & Trost, Architects

above the mechanical department, there are woodturning and woodworking shops.

The large lunch room with its kitchen and store room, occupy the space between the two wings, utilizing the space in a unique manner. The cafeteria itself is finished in white and is equipped with the latest type of lunch room tables, and the kitchen has hotel ranges, steam tables, etc. The room is so fitted and managed that fifteen hundred lunches can be served in the space of an hour. It is equipped with electric fans and with unusually large exhaust flues so that it is kept cool and odorless at all times.

The most striking feature of the first floor is the large auditorium which, as mentioned above, is set in the angle between the two wings of the building. The room has a total seating capacity of fifteen hundred and is finished after the Doric style. It has a large stage, suited to school theatricals and equipped with several sets of scenery, drop curtain for motion pictures, fly galleries and a complete electrical outfit. Immediately in front of the auditorium is the main corridor 22 feet wide, connecting the two wings of the building and giving access to two main stairways, to the main entrance hall, and to the administrative rooms of the building. This hall, which is finished in classic style, with heavy ceiling beams, attached pilasters and a marble floor, suggests most fittingly the stability and completeness of the building and the character of education which it will make possible. As an introduction to the active working rooms of the building, it is most impressive and elevating. The architects here have understood the necessity to maintain proper restraint when the effect may easily have been garish.

In addition to the auditorium and the administrative rooms, the first floor also contains four study rooms which are used for large classes as well as for society purposes. These are located at the extreme ends of the building where cross light and ventilation may be had and where ready access to the stairways and exits may be obtained. In addition to these there are on the floor twelve classrooms, boys' and girls' locker rooms, toilets and service rooms.

On the second floor there are, at the extreme ends of the wings, two large study halls occupying the space identical with the four small halls on the first floor. There are also twelve additional classrooms, locker and toilet rooms, a teachers' retiring room and a large library and book room. The library is placed in the space above the main entrance where it is most readily accessible from all parts of the building. The room is quietly finished and has the most modern library furniture throughout. The gallery of the auditorium is also entered from the main corridor of the second floor.

The third floor accommodates a number of interesting departments. One wing is given up entirely to laboratories and laboratory lecture rooms. These include a large general lecture room and three small lecture rooms and physical, mechanical, electrical and biological laboratories. Each of the laboratories has in connection with it, a store and work room for the instructor.

The art department is rather unusually located in the attic over the main entrance. Both the mechanical drawing room and the art rooms have ample skylight as well as side light. The business department is arranged in a suite in the other wing of the third floor. In this same wing, there are a physiography laboratory, two classrooms and a large music room.

Structurally, the building is as permanent and substantial as it is educationally complete. The entire building is constructed of reinforced concrete, with exterior walls of gray pressed brick and interior walls of brick

and tile. The floor in the main corridor is of marble and in the side corridors of quarter-sawed oak. The cafeteria, locker rooms and laboratories have composition floors and the classrooms, hard maple. The stairs have treads of non-slipping composition. The toilet and shower rooms are finished in tile and marble and have terrazzo and tile floors. The interior wood finish which is limited to a minimum, is white enamel in the auditorium, in the domestic science rooms, in the toilets and showers. In the remaining rooms birch has been used in mahogany finish

The sanitary equipment of the building is of the latest improved school type. The heating and ventilation are provided by means of a low pressure plenum system of the indirect type. Direct radiation is not provided in any of the classrooms or laboratories. The fresh air ducts are carried to the vertical risers through tunnels under the ground floor corridors. All the air provided for the building is drawn in at a high level so that it is free from dust, and is forced through a washer before it strikes the heating coils and is pumped by the fans into the tunnel. The system is so arranged that the air may be cooled during the heated season of the year. The plumbing equipment is of an improved school type and has been especially selected for heavy duty. The building is equipped with a complete system of vacuum cleaning, with an automatic programme clock and with intercommunicating telephones.

The classrooms throughout the building are furnished with oak tablet-arm chairs. The lecture rooms are equipped with stationary tablet-arm chairs and the study halls have stationary and adjustable desks and seats. The laboratories are fitted with especially designed furniture which cost $10,992.15. The total furnishings of the building cost approximately $35,000 up to the present writing, and further expenditures of $20,000 are being planned for additional shop equipment.

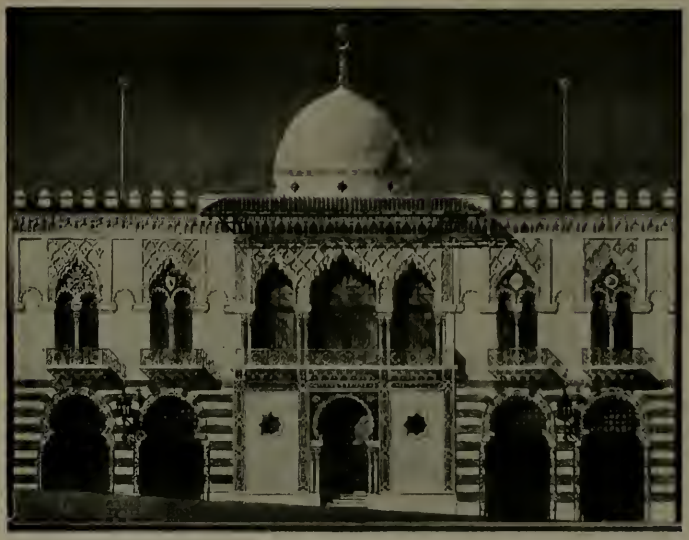
The building is rated at a normal pupil capacity of 1,600 to 1,800, but it is estimated that fully 2,000 to 2,200 will be accommodated when the shops and other facilities are used for a school day of eight hours. The building cost a total of $446,586.09, without grounds or movable equipment. The total cubage is 2,250,000 cubic feet and the ground area covered is 50,000 square feet. Figured on the cubic basis, the building cost 14.9 cents.

The stadium, which is the only large permanent stadium in the southwest, occupies a natural hollow in the site. It is built entirely of concrete and has a total seating capacity of ten thousand. Within the seating space there is room for a large baseball diamond, football gridiron, running track, etc. The stadium is used regularly for all athletic events, pageants and other outdoor festivals. It serves also as a drill ground for the high school cadet corps.

* * *

World's Record for Pile Driving

The world's record for driving reinforced concrete piles in eight hours has been broken at Pier 3, San Francisco water front, by Mr. J. D. Hannah, general contractor, whose crew drove twenty-two piles, each 100 feet long and weighing twenty-six tons. The previous record was made by the Healy-Tibbitts Construction Company at Pier 31, when twenty-six piles, each 70 feet long and weighing sixteen tons, were driven in an eight-hour day. These records have been verified by the State Board of Harbor Commissioners.



ISLAM TEMPLE, SAN FRANCISCO
T. Paterson Ross, Architect

Islam Temple—An Example of Arabian Architecture

By J. F. DUNN, Architect

IN the new Shrine Temple being erected on Geary street, San Francisco, is found a rare example of a building designed in an historical style, remote from our twentieth century civilization and ideals, yet nevertheless logical and quite in harmony with its surroundings.

Students of architecture will readily recognize in Mr. Ross' design an adaptation from the Alhambra, a building that stands as the highest mark of Arabian art and civilization.

There will probably never be produced a new "Alhambra" any more than a new "Parthenon" or new "Pyramids," for these great buildings were the expressions of ideas and aspirations peculiar to societies which have perished long ago.

In the excellence of its plan and construction the Shrine Temple is a thoroughly modern reinforced concrete structure, with a facing of polychromatic terra-cotta, in place of a plaster, pressed by moulds as used by the Moors. This building is, in fact, a modern structure with Arabic decorative expression, just as the Shrine itself is an Organization, modern in its ideals but possessing an Arabic ritual.

Arab art takes its place with the arts of Greece and Japan, as one of the three great schools into which all styles of ornament naturally fall.

Beauty and simplicity, the restrained rhythm and order which form the essential foundations of Greek art, as distinct from the vivacious realism and unsymmetrical decorations of the Japanese as from that elegance and com-

plexity produced by geometrical involutions, symmetrically constructed, which constitute the basis of Moorish art.

These three styles have been compared by Monsieur J. Bourgoin, in his "Elements of Arabic Art," to the three Kingdoms of Nature. Greek art he likens to the animal kingdom, the Japanese art to the vegetable kingdom, and Arabian art, from the symmetry which recalls the crystallization of minerals in its uniformity of configuration, and its elementary structure, he compares with the mineral kingdom.

The ground area covered by the building is one hundred feet on the northerly line of Geary street by 137 feet in depth, between Jones and Leavenworth streets. The basement and first story will be a garage.

The second story contains an entrance hall, covered with a stalactic-supported dome, pierced by star-shaped apertures. In the rear is a large auditorium, 100 feet square, without columns.

On each side of the entrance hall in the second story will be found the offices and committee rooms. A mezzanine floor provides rooms for the band, storage rooms, etc.

The general tone of the exterior is a cream, with ornament and tile in red, and touches of blue in the background. The woodwork of the cornice and lattices in the arches is a peculiar vivid green, and much of the detail is similar to that seen in Constantinople and Cairo, and often depicted in painting by Gérome, the painter of Oriental life. Can one ever forget his "Dans du Sabre" or "Une Prière Dans La Mosquée"?

The double twin, or Ajimez windows, the spandrils and architraves at the main entrance, are enriched by Shrine emblems in gold on a blue background, intertwined with Arabic mottoes, the famous one of Mohammed I and his successors, "Wa La Ghalib Ila Ala" (There Is No Conqueror But God) is repeated many times; also "Peace be unto you, Unto you be the Peace," is over the entrance.

The loggia and vestibule have a dado of blue, red and yellow azulejos facing the walls.

At this time of writing the color scheme of the interior is only in the study stage, but, having regard to other completed interiors by Mr. Ross, especially panels painted in the manner of the T'ang Dynasty at San Francisco, it is not too much to confidently expect that the color treatment will be equal to the architectural, and not the least important factor.

The architect of Islam Temple, Mr. T. Paterson Ross, has designed buildings in almost every style of architecture, even Chinese. His latest excursion in the Arabic style, a style just as far removed from present-day requirements as the Chinese, carries with it the conviction that it is the logical solution of this particular problem, and the actual building, on account of facing the south, will look as bright and oriental as the conventional cast shadows shown in his rendered elevation.

The building is composed of permanent materials, all the terra-cotta, brick and concrete being frankly such and not imitations of other materials.

* * *

The Amateur Architect

He built his house without the aid
Of architect or plan,
And yet one little error made
This most unhappy man.
It was an excellent affair:
Three stories, each a flat.
But anywhere
To put a stair—
He never thought of that!
—Building Age.

Dry Rot—Its Causes and Prevention

By E. J. GOODACRE, A. M. Inst., C. E.

The recent discovery of the presence of dry rot in the floors of the new William Land school building at Sacramento, has resulted in an investigation as to the cause and possible remedies. The architects, Messrs. Shea and Lofquist, of San Francisco, are preparing a report for the Sacramento city authorities and drastic methods will be advocated to correct the trouble and insure the building from possible continuance of the destructive growth. The architects attribute the presence of the fungi, or so-called dry rot, to excessive moisture, due partly to improper ventilation under the floors and partly to Sacramento's peculiar climate.

The following paper by Mr. E. J. Goodacre, C. E., describes the causes of dry rot and offers some valuable suggestions for preventing its ravages.—EDITOR.

THE prevalence of dry rot in this country is caused by the growth of fungi, which are responsible for the rotting and eventual destruction of structural timbers in buildings, etc. Dry rot fungi are of domestic growth, and are not found in living trees, but the disease may possibly originate when the trees lay fallen in the forest.

Merulius lacrymans, which derives the former part of its name from Merula (black bird), due to its eventual discoloration, and the latter part being appropriate because of the "tears" often observable in conjunction with it, is the most malignant form of dry rot; it thrives in moderate climates and over clayey subsoils—this is important in drafting building by-laws in such districts for the prevention of dry rot. When once established it will develop and destroy the driest timbers, owing to the property which it possesses of producing its own "tears" or moisture.

Infection of wood is due to spores, which are produced in large dark-brown rust-like undulating patches with white margins, and are known as fructifications, which, when facing upwards on horizontal supports are usually sterile, and fertile when facing downwards. The spores of Merulius, when kept dry, retain their vitality for many months, which thus increases the infectiousness of the disease.

Spores are also formed on the hyphae, which are long, slender, tube-like formations, which weave themselves into strands or cushions, known as the mycelium. This characteristic is very important, as it is prima facie evidence of dry rot. These fungal cords possess great powers of resisting drought, and enable the fungi to spread very rapidly over unnutritious surfaces, such as glass, brick walls, mortar joints, and iron pipes, for considerable distances to other woodwork.

The old idea that Merulius lacrymans requires an alkali—such as ammoniacal exhalations—to promote the development, has, according to later research, proved to be erroneous. Merulius is capable of destroying the sapwood and heartwood of most woods, especially coniferous timbers. Hardwoods are not immune from the malady.

The cause of dry rot is directly attributable to infection—chiefly by direct contact—accompanied by conditions favorable to the germination of the spore. The spores are microscopic in size. It is computed that there are 9,000,000 spores to a square inch, therefore on an average-sized plant there are, roughly, 100,000,000 spores, each capable of much harm, and their small, brown, dust-like nature enables them to float a long distance in the air before settling. Should this resting-place prove to be congenial to its growth, then infection is assured.

The conditions required for fertility are moisture and moderate temperature. The rate of decay is dependent upon the relative humidity—the

ratio of the amount of moisture to saturation point at a given temperature (10 to 20 degrees Cent.).

Moisture is, therefore, essential to the activity of dry rot fungi in a greater or lesser degree, according to the species; but it must be noted that the degree is fairly constant to the respective fungus. For instance, Coniophora demands a good deal of moisture, and is most frequently found in cellars. So great is the affinity which this fungus has for moisture that its growth is prima facie evidence of a damp building; it is often found growing on a rafter under a leaky roof. On the other hand, Merulius and Polyporus, when once established, can grow on the driest wood, depending on their own power for the production of moisture. This fact renders Merulius, which possesses this function to a much greater degree than Polyporus, the most insidious source of dry rot.

Chemical analysis of rotted wood shows that it contains relatively less hydrogen than carbon than the sound wood. This would appear to indicate that moisture is produced by oxidation. Authorities differ as to whether these fungi can be grown in water.

Temperature affects the fungi, causing dry rot. Merulius lacrymans thrives at a moderate temperature. The mycelia are rapidly killed by exposure to a temperature of 40 degrees Cent.; so that infected wood can be easily sterilized by heat that does not burn the timber. Spores and the fungi themselves are quickly killed by steam, but the resistance to lower temperatures is greater, and frost does not affect it.

Dry rot progresses much faster in summer than in winter in an ordinary building which is heated, and thus has its air made relatively dry during the winter months.

In examining a building affected by dry rot the fungi should be carefully and minutely examined with a view to identifying the species. The extent of the rotting can generally be estimated approximately by boring test holes in the timber at frequent intervals. If the material is badly rotted the borings brought out will be in the form of brown powder. Hammering on the timber with a hammer is another method frequently adopted, a dull sound denoting probable rotting internally. The presence of dry rot fungi can often be detected by the familiar unpleasant odor.

The first obvious preventive measure is to guard against contact with infected wood, including spores. Fungi are frequently carried in lumber and spread by placing it in large piles with scant ventilation. This, no doubt, accounts for the fact that original infection of timber in the majority of cases is contracted in the timber yard of builders' stores. Lack of sanitation and bad methods of stacking sawn wood aggravate the disease. It would appear advisable that the whole of a timber yard should be well paved in tar-macadam and thoroughly drained.

The next means of prevention is to deprive the fungi of the conditions favorable to growth. In the first place, then, the timber should be thoroughly dry and well seasoned—in fact, it would be well to have all timber, such as floor joists, etc., dessicated or "stoved" to a temperature of 50-60 degrees Cent. The seasoning is rendered more important nowadays owing to the amount of timber felled before maturity. The timber should be protected from wet during building operations, and afterwards protected by adequate ventilation and suitable methods of construction.

To secure these measures then, in practice the following methods should be adopted to prevent the development of Coniophora cerebella, that requires definitely moist wood, and also to decrease the susceptibility of the timber to Merulius.

The wood should be brought direct on to the job and placed under cover; the floor joists, especially the ground-floor joists, should be creosoted; the objection to the smell of this treatment, of course, is against it, but it is more apparent than real, especially after some months' exposure.

All vegetable earth should be removed from under floors, as ammoniacal exhalations are certainly favorable—though not essential—to the growth of the fungi causing dry rot.

The building site should be covered with at least 4 inches of cement concrete asphalted on the upper surface. This, however, is an expensive method, and it is suggested that 4 inches of tar-macadam would be a very effective substitute.

The ventilation underneath floors should be carefully designed, because if it is not thorough it will do more harm than good. For instance, you will possibly be supplying moisture and oxygen—two essentials to the growth of fungi. The best method, therefore, is to fix fresh-air inlets on all sides of the under floor space, with an extraction flue taken up the chimney breast alongside the smoke flues. Should there be a solid floor adjacent to any side of an open floor, through currents of air should be ensured by laying ducts through the solid floors.

The ends of all joists should be fixed in such a manner that there is a passage of air all around the end of the joist as far as possible. A good method of attaining this is to let the joists take a bearing on a 2-in. by ½-in. flat bar of iron laid on the supporting wall.

Pugging should be avoided in floors.

Immunity from dry rot is encouraged by laying the concrete, etc., under the floors at any early stage of the erection and delaying the laying of floors until the latest possible moment, when the house is comparatively dry. Needless to say, the floorboards should be stored in a dry place before use.

Care should be taken that no shavings are left under the floors by the carpenters, as this practice is frequently the origin of dry rot. In cases where boards or wood blocks are fixed directly on the concrete they should be bedded on some bitumastic compound; the concrete and the screeding also must be thoroughly dry. On no account should wooden pegs driven in the ground be used as concrete screeds.

Linoleum and other similar floor coverings aggravate the activity of the fungi causing dry rot, but floors should be so constructed as to obviate any ill effects from their use.

Skirtings and other wall mouldings should on no account be fixed until the walls are quite dry. The practice of rendering walls behind skirtings with cement is to be commended, but it must be perfectly dry before skirting is fixed.

Studded partitions should be plastered with ordinary plaster, which is somewhat porous and admits of ventilation.

Special attention should be given to dampcourses with a view to minimizing the risk of dry rot. The more extensive use of vertical dampcourses would be a step in the right direction. Horizontal dampcourses are frequently fixed only just above the ground level and just below the joist level, with the result that the bricks are continuously soaked with moisture, and, therefore, form a reservoir from which fungi may draw their "life blood." Lead, asphalt bitumastic compounds on fabric and slates in cement are all satisfactory.

Hollow walls suitably ventilated is a system of construction especially to be recommended from this standpoint. In this system the ends of floor joists should be open to and not project into the cavity. Lead and asphalt

flats on a wooden sub-structure are very prone to dry rot, and where the underside of the joists are ceiled the preventive measures present difficulties. Reinforced concrete, however, has enabled us to overcome the use of timber in such cases.

It is necessary to take particular care that no timber should be painted which is immaturely seasoned or rot dry.

In dealing with cases where the presence of a serious attack of dry rot has been established more drastic action is necessary. The infected wood should be oiled to keep down the spores, and carefully removed and burned, and not deposited in a builder's yard. The carpenters' tools, especially the saw, used on the work should be sterilized. This may appear to some to be rather too stringent, but the advisability of such a precaution is undoubted. The adjoining woodwork should be carefully tested, as previously stated, and removed if there are the least signs of the fungi. The brickwork or stonework should be sterilized by a blast flame, and the woodwork should be dried—not by a gas jet, which forms moisture as a product of combustion—and treated with a wash of dilute formalin, which is a safe and most effective antiseptic, although it must be noted that through evaporation this treatment is purely temporary. Carbolic acid is also a valuable antiseptic for this purpose.

Hot limewash is very useful for a mild attack, and, in fact, most antiseptics are more or less effective.

It must, however, be strongly urged that, owing to the difficulty of completely eradicating the fungi when once established, preventive measures are of paramount importance.

In conclusion, it is necessary to say that the present knowledge of fungi causing dry rot is immature, and the results of research are often very eccentric and sometimes contradictory. The author has endeavored to compile the generally accepted results of the valuable work already accomplished by experts in this and other countries, together with a few practical suggestions.

The annual loss in this country alone through dry rot must be alarming; and, in view of the diminishing timber supplies, this also renders the subject one of extreme national importance.

* * *

Cantonment Building Not Prejudicial to General Construction Business

The published charges against contractors building contonments for the Federal Government on percentage basis having paid above market rates for labor and materials and thereby having injured general business, are characterized by Colonel I. W. Lippell of the Quartermaster's Corps, in charge of cantonment construction, as being false and pernicious, tending to hamper the work. The contractors were selected and the contracts awarded with great care and each contract contained provisions against increasing the rate of wages or paying extra prices without special Government approval. The employment of about 100,000 men for this class of work naturally will draw them temporarily from other construction, but will not interfere seriously either with existing large organizations or with the securing of small forces which can always be collected without much trouble for casual jobs.

The Province of the Architect

HOME builders of today find the services of the architect more necessary than in former times, even though the art of house building was practiced in the days of Thorpe, Inigo Jones, Wren and the brothers Adam in the same way as it is now, and all these architects carefully designed their buildings on paper and had them built much as we do today. There is one great difference, says the Countryside, between their methods and ours. Then there was only one style current in each period. The builder of old, who erected the houses from the architect's plans, had under him masons and carpenters who were masters of their crafts, and who were capable of contributing something to the general effect of the building. The carpenter, the mason and the joiner working for the contractor are still highly skilled men, but their efforts have become mechanical, since they look to the architect for information and for all details of construction. There are so many methods of building and styles of architecture in vogue at present, and the architect is so anxious to express his own individuality in the building, that the craftsman must depend on the architect's guidance.

Granted that the employment of an architect is today a necessary first step in the building of a house, it may be interesting to consider just what an architect is and what his functions are; what his relationship should be to the owner, and where the responsibility for the various branches of the work should rest. There are many varying definitions of the term "architect," but the one which seems most concisely to phrase the status of the profession is offered by the American Institute of Architects: "An architect is a professional person whose occupation consists in originating and supplying artistic and scientific data preliminary to and in connection with the construction of buildings; in supervising the operations of contractors therefor; in preparing contracts between the proprietor and the contractor thereof."

The owner must respect the professional judgment of the architect he has selected more than his own, in architectural matters. It is not enough that the owner commission an architect to design his house; he should then trust the man he has chosen. He has it in his power to defeat all that the most highly trained man can devise. At the same time it must be remembered that the man who has made up his mind to build often has very definite ideas about his problem. The architect, with a little ingenuity, can honestly attempt to meet the owner's requirements without doing much violence to his preconceived ideas of what the solution should be.

Where possible, the architect should be consulted about the selection of the site, especially if a house of particular style is desired. In the first interviews with the client, the architect should learn positively all the requirements of space and the outside limit of cost. From these data he solves the schematic problem. The solution is presented for the owner's consideration in the form of preliminary sketches showing the floor plans on a small scale, and, perhaps, a perspective drawing rendered in color or pen and ink, showing the proposed house. At this stage of the work all refinements and changes should be incorporated. When the whole scheme has been definitely determined upon, the architect proceeds with the preparation of the working drawings and the specifications. These should be sufficiently complete to include all work to be executed.

Reproductions of these drawings and specifications are presented to a selected list of contractors, perhaps eight or ten, whose business it is to estimate the cost and present bids to erect the building. Although there are several methods of procedure in contract work, the most common practice is to construct the building under a general contract, in which responsibility for the house complete is vested in the contractor. A standard form of agreement between contractor and owner has been compiled and approved by the American Institute of Architects, the National Association of Builders' Exchanges and allied building trades, and is generally used. By the terms of this agreement the contractor agrees to provide all material and to perform all the work shown on the drawings and described in the specifications as prepared by the architect. It is usual for the architect to include the arrangement of all sanitary equipment and selection thereof, the heating and ventilating systems, the artificial lighting, the arrangement of bell and telephone wiring, and the layout of all special equipment, the design of all fixed furniture, and, in some cases, the movable furniture, etc. The owner agrees to pay the contractor for the performance of the contract.

The architect is not the agent of the owner, unless so authorized by the owner, but he has general supervision and direction of the work. The architect has authority to stop construction work whenever such stoppage may be necessary to insure proper execution. The architect makes all decisions on claims of both owner and contractor, and on all other matters relating to the execution and progress of the work; all his decisions, however, are subject to arbitration. The architect furnishes the contractor free of charge, by means of drawings and otherwise, all instructions necessary for the proper execution of the work, and as many copies of these drawings and specifications as are reasonably necessary.

All drawings, specifications and copies of these furnished by the architect are his property. They must not be used on other houses, but are to be returned to him. If models of the house have been made, they are the property of the owner. The owner, the architect and their representatives have access to the work at all times, and the contractor is bound to provide proper facilities for inspection.

During the construction of a house the contractor submits to the architect an application for each payment that is to be made, and the architect issues to the contractor a certificate for such amount as he decides to be properly due at that time. The making and acceptance of the final payment constitutes a waiver of all claims by both owner and contractor. The contractor is responsible to the owner for the acts and omissions of his sub-contractors. If the contractor should neglect to prosecute the work properly, or fail to perform all of the provisions of the contract, the owner, after due notice to the contractor, may make good such deficiencies, and may deduct the cost thereof from payments due, provided the architect shall approve both such action and the amount charged to the contractor.—American Contractor.

* * *

Most people have the kind of judgment that knows just how the basement should be excavated about the time they are shingling the roof.

The ordinary man doesn't want a fireproof house as much as a fireproof job.

Many a house has the knocker on the inside.

New California State Building Laws Now in Effect

THE new State tenement house, hotel and dwelling laws, regulating the construction and maintenance of such buildings, went into effect September 1 and are now being enforced by the various municipal building departments. No radical changes have been made in the tenement house law, the amendments relating chiefly to minor regulations of planning and construction. The hotel law has been amplified and now contains practically all the applicable provisions of the tenement house law.

An entirely new law is the State dwelling house act. While it is aimed to prevent the building of improperly lighted and unsanitary shacks for human residence, the provisions as drawn apply to all kinds of dwellings, including flat buildings, and in some instances these may interfere with what has been recognized practice in planning and erecting dwellings, not inherently bad when all conditions are considered, but now, nevertheless, placed under ban The principal provisions of this law relate to relative areas of windows and sleeping and living rooms, height of ceilings and light courts or unoccupied areas of lots upon which windows open. No living or sleeping room can have less than 90 square feet of floor area and the window area in each of such rooms shall be at least one-eighth of the floor area, all measurements for windows being taken to the outside of sash. The minimum width of any such room is seven feet and the minimum ceiling height measured between the finished floor and finished ceiling is eight feet.

Every living and sleeping room shall have at least one window of the area prescribed by the act opening upon a street, or an unoccupied area of the lot not less than four feet in width. A cornice may extend into the unoccupied area two inches for each one foot of the unoccupied area, or court. This means that with a minimum unoccupied area of four feet the cornice would be limited to eight inches

All applications for permits to erect dwellings filed with the city building department must now state, in addition to the information ordinarily required, whether there are any living rooms in the basement; the least area of any living room; minimum ceiling height; size of window courts, that is, unoccupied areas upon which windows open; width of cornice projection, in inches; minimum height of floor joist above ground, the law requiring at least six inches clear space; whether the entire space under the house will be enclosed, the law requiring openings with removable screens; whether the window area will be one-eighth of the floor area in each room; and whether all requirements of the State dwelling house act will be complied with.

* * *

The Charm of a Chinese House

The most wonderful thing about a Chinese house is the spirit of peace which seems to pervade it, says an exchange. The courtyards, enclosed by houses, which are in turn surrounded by high walls, have an air of security and seclusion which is not to be found in our Western homes. Into these peaceful courtyards the noise of the busy world does not penetrate. The triple doors seem to shut out the storms of the world and its troubles. In the more pretentious houses some of the courtyards are transformed into miniature landscape gardens. There are miniature mountains, precipices, lotus ponds, bridges, grottos and rustic nooks. The irregular rocks are so well fitted together and built up against the sides of the house that they seem to have been placed there by nature long before the houses were erected.

MARTINEZ GRAMMAR SCHOOL, MARTINEZ, CALIFORNIA
STONE & WRIGHT, ARCHITECTS

Coast Engineers Train for Active War Service

THE following engineers, many of them well known to the profession on the Pacific Coast, are now quartered at the Government training camp at Vancouver, Wash., making ready for early service in France. Mr. Chas. L. Wing, who heads the list as major, has long been a member of the Stanford University faculty and is a recognized authority on reinforced concrete construction. Mr. E. T. Thurston, appointed a captain, has been in the contracting business in San Francisco since the fire of 1906. At one time he was associated with Mr. Maurice C. Couchot, consulting engineer. Readers of this magazine will recall two articles in the August issue written by Mr. Thurston and which were quite characteristic of him.

MAJORS

Charles L. Wing, Palo Alto.

CAPTAINS

W. O. Allen, San Diego.
C. Anderson, Redwood City.
T. R. Beeman, Seattle.
W. J. Bennett, Seattle.
W. H. Bissell, Alameda.
F. J. Boland, San Rafael.
E. F. Chase, Seattle.
R. E. Child, San Francisco.
S. B. Clark, Spokane.
W. D. Clark, Salem, Ore.
F. S. Cook, Portland.
F. L. Davis, Portland.
L. V. Degnan, Berkeley.
E. C. Dohm, Olympia, Wash.
E. P. Dudley, Kellogg, Idaho.
A. W. Elam, San Francisco.
G. A. Ferguson, Seattle.
R. S. Haynes, Fresno.
W. H. Estabrook, Boise, Idaho.
F. W. Hyland, San Francisco.
J. K. James, San Francisco.
J. A. Kitts, Berkeley.
G. V. Lintner, San Francisco.
L. B. Livermore, San Francisco.
J. A. McAllep, San Francisco.
C. B. Mc Cullough, Corvallis, Orc.
T. McDougal, Tigard, Ore.
O. D. McVay, San Francisco.
C. H. Mace, Denver.
E. Mehlert, Jr., San Francisco.
L. Messigman, Seattle.
L. S. Miller, Anglersvale, Ore.
C. C. Moore, Seattle.
O. A. Piper, Seattle.
H. S. Russell, San Francisco.
J. J. Rosenthal, San Francisco.
W. E. Spragins, Salt Lake City.
W. J. P. Simpson, Seattle.
G. G. Steele, Vancouver, Wash.
E. T. Thurston, San Francisco.
M. J. Ulrich, Spokane.
W. N. Vance, Santa Barbara.
G. H. Wilson, Jr., San Francisco.
G. P. Varney, San Francisco.

FIRST LIEUTENANTS.

H. Abernathy, Berkeley.
L. F. Albert, Boise, Idaho.
F. F. Barber, Everett, Wash.
J. R. Arnold, San Francisco.
F. E. Becker, Olympia, Wash.
L. J. Berry, Bremerton, Wash.
A. Boley, Bremerton, Wash.
A. F. Bridge, San Francisco.
W. B. Brigham, San Francisco.
A. W. Bryan, Starbuck, Wash.
C. J. Chaffins, Sandpoint, Idaho.
S. G. Chamberlain, San Fernando.
L. M. Chase, Portland.
M. E. Clark, Seattle.
R. F. Cole, Hoquiam, Wash.
R. Conover, Oakland.
H. C. Darling, San Jose.
G. W. Davis, San Francisco.
J. Doman, Oakland.
K. C. Dorsett, Seattle.
F. Ebershacker, Aberdeen, Wash.
S. E. Evans, Berkeley.
O. A. Gierlich, El Monte
B. J. Garnett, Spokane.
F. P. Gowan, Burns, Ore
G. E. Gray, Fresno.
G. St. J. Hale, San Jose.
G. G. Hall, South Bend, Wash.
C. W. Heinecke, Portland.
C. F. Heintze, Sacramento
R. E. Hermann, Jr., San Francisco
C. E. Hetrick, Mammoth, Cal.
B. M. Howard, Portland.
R. Irvin, Salmon, Idaho.
M. Jepson, Sparks, Nev.
C. R. Johnson, San Francisco.
G. E. King, Oakland.
C. L. G. Kregbaum, San Francisco.
E. P. McAuliffe, San Francisco.
W. B. McMillan, San Jose.
P. D. Mackie, Seattle.
L. G. Metcalf, Antioch.
R. A. Monroe, San Francisco.
A. Morbio, San Francisco.
P. M. Mosier, Cummings, Wash.
A. W. Newberry, San Francisco.
R. M. Overstreet, Seattle.
L. W. Orynsky, Berkeley.
J. F. Partridge, San Francisco.
N. C. Pearson, Portland.
H. S. Peckham, San Diego.
H. M. Power, San Francisco.
A. G. Raisch, San Francisco.
C. L. Rakestraw, San Francisco.
M. E. Ready, Berkeley.
F. O. Rose, Seattle.
J. H. Scott, Portland.
E. A. Shafer, Olympia, Wash.
W. T. Smith, Alpina, Wash.
E. G. Snedaker, San Francisco.
P. W. Stafford, Sacramento.
J. Summerset, Chehalis, Wash.
V. L. Sylliaasen, Seattle.
G. Tripple, Seattle.
G. W. Wade, Sacramento.
R. G. Wadsworth, Grafton, Cal.
G. F. Walker, Redwood City.
A. G. Weber, Berkeley.
W. H. Wheeler, San Francisco.
J. L. Wood, Albany, Ore.
E. Zimmerman, San Francisco.

SECOND LIEUTENANTS.

W. M. Argabrite, San Francisco.
E. A. Arnold, Seattle.
B. O. Badgley, Monrovia, Cal.
J. G. Bailhachs, San Francisco.
E. H. Bean, Seattle.
L. V. Campbell, Sacramento.
F. B. Cook, Jr., Oakland.
W. A. Crosby, San Francisco.
W. B. Cunnane, San Francisco.
L. de Cew, San Francisco.
A. N. Drips, Tacoma.
R. J. Duncan, San Francisco.
P. Eastman, San Luis Obispo.
R. C. Knight, Los Gatos.
H. D. Farmer, Portland, Ore.
O. Goldman, San Francisco.
G. Hampton, Nevada City
B. C. Hill, Raymond, Wash.
R. A. Huestis, Seattle
R. R. Irvine, San Francisco.
C. O. Isaksen, Portland, Ore
D. M. Johnson, San Francisco
M. P. Kuchel, Oakland.
R. C. Knight, Los Gatos
F. W. Lebeck, Astoria, Ore
J. Lissner, San Francisco
G. A. McKeever, San Francisco
R. McRae, Starbuck, Wash
L. G. Mack, San Francisco
J. E. Otis, San Francisco
C. W. Payne, San Francisco
H. S. Peck, Garnett, Mont
H. M. Rich, San Francisco
C. W. Robins, Berkeley
W. E. Scott, Berkeley
W. L. Sharp, Portland, Ore
F. D. Sherwin, Stanford University
J. S. Smith, Pacific Grove
D. B. Taylor, Berkeley
W. B. Upton, Seattle
C. E. Waite, Vancouver, Wash
L. R. Wakefield, Seattle
G. Zander, Berkeley

THE
Architect and Engineer
OF CALIFORNIA

Founded in 1905 by E. M. C. WHITNEY

A. I. WHITNEY - - - *Manager*
T. C. KIERULFF - - - *Legal Points*
FREDERICK W. JONES - - *Editor*

Published Monthly in the interests of the Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast by the Architect and Engineer.

BUSINESS OFFICE AND EDITORIAL ROOMS
627-629 Foxcroft Building, San Francisco
Telephone Douglas 1828

The publishers disclaim any responsibility for statements made in the advertisements of this magazine

TERMS OF SUBSCRIPTION
(Including postage) to all parts of the United States $1.50 per annum; to Canada 50c additional; to all Foreign points $1 additional.

VOL. L. SEPT, 1917 No. 3.

ASSOCIATE EDITORS

WM. B. GESTER, - *Inspection and Tests*
O. P. SHELLEY, C. E., F. W. FITZPATRICK, } *Fireproof Construction*
W. W. BREITE, C. E. - *Structural Steel*
ATHOL MCBEAN, W. E. DENNISON, HOWARD FROST, } *Brick, Tile and Terra Cotta*
H. M. LOWENTHAL - *Roofs and Roofing*
FRED'K N. WOODS, JR., - *Rock and Gravel*
WILBUR DAVID COOK, *Landscape Architecture*
PAUL C. BUTTE - *Electrical Construction*
LOUIS G. MAUER - - *Waterproofing*
CHAS. H. CHENEY - } *City Planning and Book Reviews*
W. H. GEORGE - - *Reinforced Concrete*
T. R. BURKE - - *Sanitary Engineering*
J. W. FRICKE.. .. ..*School Equipment*

ARCHITECTURAL

Alfred F. Rosenheim	Edward M. Garden
Fred H. Meyer	Irving F. Morrow
August G. Headman	F. D. Hudson
Horace G. Simpson	Elmer Grey
G. Albert Lansburgh	Sumner P. Hunt
Herman Barth	Ernest Coxhead
Chas. S. Kaiser	Harrison Albright
Chas. Peter Weeks	John Parkinson
Octavius Morgan	A. W. Smith
J. C. Austin	William H. Weeks
John J. Donovan	Chas. W. Dickey
W. H. Ratcliff, Jr.	Jas. W. Plachek

CONTRIBUTORS

Kenneth MacDonald, Jr.	W. Garden Mitchell
Wm. L. Woollett	Nathaniel Blaisdell
Wm. Arthur Newman	Willis Polk
Wm. C. Hayes	Smith O'Brien
John Bakewell, Jr.	C. H. White
Hon. Jas. D. Phelan	B. J. S. Cahill
Clarence R. Ward	T. Paterson Ross
John Galen Howard	Alfred Kuhn
Louis C. Mulligardt	John Reid, Jr.
Arthur Brown, Jr.	

THE SCHOOL HOUSE IN CALIFORNIA

A school house in California has to meet the double demand of the community for an increasing variety of school education and a meeting place for community gatherings. The school building should provide for both these demands. It should have provision for out-of-door classes, manual training, domestic science and music as well as for the usual courses of mental training, and should be equipped with modern appliances for sanitation, with ample warmth and light and water. For community gatherings or school celebrations, there should be a commodious auditorium with a proper stage and dressing room adjoining. It should be ample and healthful to children and teachers who have to spend much of their time in it, pleasing to the eye of visitors, and commensurate with the dignity that education holds in the community.

For all of these things some provision adequate to the pressing needs of the community should be made whenever any sort of reconstruction of a school building is to be undertaken. Good planning and good workmanship are better economy than mere cheapness. The highest ideals of our public school education should in some manner be expressed and revealed in our public school architecture.

The school architects of California seem to have grasped the full importance of these various requirements, and it is gratifying to note that in designing many of the new buildings our architects have incorporated those essentials which contribute so much to the proper education and preservation of the health of our school children.

FIRE PREVENTION NOW VERY ESSENTIAL

One of the greatest items of waste in food is our annual loss by fire. This has been considered so important in food conservation that the National Board of Fire Underwriters, working with the Council of National Defense,

has made a complete study of the situation with a view to fire prevention in flour mills, grain elevators, storage warehouses, and other places where food is kept in quantities. Advisory committees of insurance officials were appointed to co-operate with State officials in ten great divisions of the country. Arrangements were then made for detailed inspections of property where food is stored to discover fire hazards, point them out to owners, show how the rate of insurance could be reduced through eliminating dangerous features in construction, and emphasizing the importance of fire protection, cleanliness and watchfulness. Two engineers were detailed on the emergency construction committee which is building large food storages to provision our troops. These engineers are specialists in fireproof construction and fire prevention and they will eliminate fire risks as far as possible. This fire prevention work has been one of the quietest voluntary services of the war, but it has been carried on with great enthusiasm, enlisting tens of thousands of insurance men, fire chiefs and State officials, property owners and others concerned in the storage of food.

SANE SHIP-BUILDING

Whilst building ships at a great rate, many and, alas, perhaps even most of which ships are doomed to be torpedoed, are we doing the building along sane lines or are we following the good old reliable mode of constructing eminently sinkable affairs?

We have put and are putting millions into such contraptions as the Titanic and the Lusitania that are guaranteed to go down upon very slight provocation; we build wondrously fine ships with conveniences that kings do not have and with most marvelous machinery for speed and what not, but we have not built and probably are not building unsinkable ships. Oh, yes, we provide bulkheads and numerous compartments, but those bulkheads have been proven to have not been where the greatest danger lay, and compartments may not be automatically or otherwise closed at the psychological moment they should be closed.

It took us twenty years to build buildings that would not burn down at the batting of an eye. We insisted that fire was an "act of God" and that the only thing to do was to go on building of wood and when fire did strike us we frantically clanged bells, and as frantically drove hose wagons through the streets and poured tons of water upon the burning building, ruining everything that was not burned.

So with the ships. It takes a long while to learn and appreciate the advantages of Prevention versus Cure.

The genius who, a few weeks ago, wanting to make sure he'd bring his ship into port took the wise precaution of filling all empty places with empty casks and barrels and cans (properly headed and water tight) had the right idea. He was aiming at *buoyancy*.

They'd get that required buoyancy, —so necessary to keep a rammed, a torpedoed or otherwise damaged ship afloat—by making the ships' decks hollow. This was preached and expounded in The Architect and Engineer and other technical journals at the time of the Titanic disaster, but not yet has a ship been built so!

Instead of using the ordinary deck beams, use eye-beams of deep section rather than thick metal. Then put on light plate flooring and lighter plate ceiling under the beams. And you have air chambers the entire width of the ship between every two beams. Air spaces always tight, not dependable upon man or machinery for effectiveness at the right moment and that would keep a ship afloat if struck by twenty torpedoes.

It would add but slightly to cost and weight and would reduce the height of decks but very little, yet think of the wonderful safety it would assure!

Have all the bulkheads and compartments you wish but also build in

these air tight decks and you can laugh at icebergs, torpedoes and such. Are we sane enough to do it or must we wait twenty years?

Plans for Washington State Capitol Group

If the building plans outlined by the Washington State Capitol Commission are carried out, the State will have a fund of $550,000 left as a balance for the main building after the Temple of Justice at Olympia is completed. The commission for preparing the plans has been awarded to Mr. H. K. White of New York, with Mr. Julius Zittel of Spokane as advisory architect. As now figured, completion of the temple, which includes facing the exterior and finishing the interior, can be done for $350,000, a saving of $200,000 from the previous estimate after the original appropriation of $350,000 for the building had been exhausted. To this will be added approximately $50,000 for the purchase of two adjoining blocks of land included in the new capitol group side plans, $25,000 for architects' fees and incidentals and an item of $10,000 for grading the capitol site. This amounts to a total of $435,000, out of $1,000,000 to be produced by the capitol building levy of one-half mill in two years. Half of the latter amount will be produced this year and the balance in the latter part of 1918, which will bring disposition of the $550,000 or more down to the opening of the next legislative session in 1919.

It is the intention of the Capitol Commission to have the Temple of Justice work completed by October 1, 1918. Contracts for the stone exterior will be let by November 1 of this year at latest, and for the interior temple work sixty days later, as the first year's tax return from the capitol levy will then be available.

American Institute of Architects

(ORGANIZED 1857)

OFFICERS FOR 1916-17

PRESIDENT.....JOHN LAWRENCE MAURAN, St. Louis
FIRST VICE-PRESIDENT.....C. GRANT LA FARGE, New York
SECOND VICE-PRESIDENT....W. R. B. WILLCOX, Seattle, Wash.
SECRETARY....W. STANLEY PARKER, Boston, Mass.
TREASURER.....D. EVERETT WAID, New York

San Francisco Chapter

PRESIDENT.....EDGAR A. MATHEWS
VICE-PRESIDENT.....SYLVAIN SCHNAITTACHER
SECRETARY AND TREASURER.....MORRIS BRUCE
TRUSTEES.....W. B. FAVILLE, G. A. WRIGHT

Southern California Chapter

PRESIDENT.....J. E. ALLISON
VICE-PRESIDENT.....J. J. BACKUS
SECRETARY.....A. R. WALKER
TREASURER.....AUGUST WACKERBARTH

Board of Directors

ROBT. D. FARQUHAR, PERCY A. EISEN, S. B. MARSTON

Portland, Ore., Chapter

PRESIDENT.....JOSEPH JACOBBERGER
VICE-PRESIDENT.....J. A. FOUILHOUX
SECRETARY.....W. C. KNIGHTON
TREASURER.....FOLGER JOHNSON
TRUSTEES.....ION LEWIS, M. H. WHITEHOUSE

Washington State Chapter

PRESIDENT.....CHARLES H. BEBB, Seattle
1ST VICE-PRES....DANIEL R. HUNTINGTON, Seattle
2D VICE-PRESIDENT.....GEORGE GOVE, Tacoma
3D VICE-PRESIDENT.....L. L. RAND, Spokane
SECRETARY.....JOSEPH S. COTE, Seattle
TREASURER.....ELLSWORTH STOREY, Seattle
COUNCIL.....JAMES STEPHEN, Seattle; JAMES H. SCHACK, Seattle; CHARLES H. ALDEN, Seattle

California State Board of Architecture

NORTHERN DISTRICT.

PRESIDENT.....EDGAR A. MATHEWS
SECRETARY-TREASURER....SYLVAIN SCHNAITTACHER

Members

JOHN BAKEWELL, JR. J. CATHER NEWSOM

SOUTHERN DISTRICT.

PRESIDENT.....JOHN P. KREMPEL
SECRETARY-TREASURER.....FRED H. ROEHRIG
MEMBERS.....OCTAVIUS MORGAN, SUMNER P. HUNT, WM. S. HEBBARD

San Francisco Architectural Club

OFFICERS FOR 1917

PRESIDENT .....CHAS. PETER WEEKS
VICE-PRESIDENT .....A. WILLIAMS
SECRETARY .....JOHN F. BEUTTLER
TREASURER .....WILLIAM HELM

San Francisco Society of Architects

President .....GEORGE W. KELHAM
Vice-President .....JOHN REID, JR.
Secretary-Treasurer.....WARREN CHARLES PERRY
Director (1).....CHARLES PETER WEEKS
Director (2).....ARTHUR BROWN, JR.

Engineers and Architects Association of Los Angeles

PRESIDENT.....A. H. KOEBIG, SR.
FIRST VICE-PRESIDENT.....A. S. BENT
SECOND VICE-PRESIDENT.....IRA J. FRANCIS

Directors

J. J. BACKUS, GEO. P. ROBINSON, ALBERT C. MARTIN, H. L. SMITH

Washington State Society of Architects

PRESIDENT.....A. WARREN GOULD
SECRETARY.....WM. J. JONES
TREASURER.....J. L. MCCAULEY
TRUSTEES.....HARRY H. JAMES, WM. J. JONES, ALFRED BREITUNG, J. L. MCCAULEY, G. F. ROWE

San Diego Architectural Association

PRESIDENT.....CHARLES CRESSEY
VICE-PRESIDENT.....W. TEMPLETON JOHNSON
SECRETARY.....ROBT. HALLEY, JR.
TREASURER.....G. A. HAUSSEN

San Joaquin Valley Ass'n of Architects

PRESIDENT.....W. J. WRIGHT
VICE-PRESIDENT.....E. B. BROWN
SECRETARY-TREASURER.....FRANK V. MAYO

With the Architects

Building Reports and Personal Mention of Interest to the Profession

Personal

Mr. William H. Wheeler, of the architectural firm of Wheeler & Halley, San Diego, has received a commission as captain in the Engineers' Reserve Corps of the United States Army. Mr. Wheeler was born in Australia and has been a citizen of the United States for eighteen years.

Mr. J. B. Lyman, Jr., formerly of San Diego, now located at Tucson, Ariz., has been appointed consulting architect for all state work in Arizona by the commission on state institutions. Mr. Lyman is the architect for the Mines building at the University of Arizona, work on which has just been started. Mr. Lyman will have supervision of more than $500,000 worth of work for the state.

Mr. George Cromwell, city engineer of San Diego, who has been commissioned a captain in the engineer corps of the United States Army, has been granted a leave of absence by the city council of San Diego until the close of the war. Mr. Cromwell is under orders at Ft. Leavenworth, Kan.

Mr. Edwin Bergstrom of Los Angeles has been re-elected president of the housing commission of the city of Los Angeles for the ensuing year.

Mr. J. A. Manington, structural engineer in the Los Angeles Department of Building, has been ordered to report immediately to the Engineer Officers' Training Camp at Fort Leavenworth. Mr. Manington has already received a commission as captain.

Mr. Edward Cray Taylor, of Los Angeles, has been commissioned as first lieutenant in the Engineer Reserve Corps of the United States army.

Mr. Sidney B. Newsom, formerly located in the Nevada Bank building, San Francisco, has received a commission in the Engineers Corps and has joined the colors.

At a simple ceremony performed by Rev. C. L. Mears, Miss Ella Browning, daughter of former City Clerk Frank Browning, of Alameda, became the bride of Mr. Raymond K. Shaw, a young Fresno architect. The couple will make their future home in Fresno.

Mr. W. J. Dodd, architect of Los Angeles, has recovered from a serious illness which confined him to his home for several weeks.

Messrs. Wilson & Eager have dissolved partnership and the business will be continued by Mr. Frank O. Eager. The office will be continued in the American National Bank building, Monrovia.

Two More Bank Buildings

San Francisco is to have two more bank buildings, in addition to the American National Bank building, a ten-story structure, now under construction at California and Montgomery streets, San Francisco. The Federal Reserve Bank has purchased a lot on Sansome street and will spend $250,000 on a building of its own. The Canton Chinese Bank is having plans prepared by Messrs. Wm. Wilde and Otto Schiller for a $75,000 Class "A" bank and office building on the northwest corner of Montgomery and Sacramento streets.

Another prospective bank building for San Francisco is for the Fleishhacker interests, who some months ago purchased the lot east of the Hobart building and on the north side of Market street. This will probably be the home of the London Paris National Bank. Several architects have submitted tentative plans, among them Willis Polk & Company, who have made a sketch for a tower-like structure, rising to a height of forty or more stories.

Messrs. Weeks & Day Planning Theatres

Announcement is made that the actual working drawings for the new $100,000 theatre to be constructed in San Jose, for Mr. T. S. Montgomery, are being prepared in San Francisco by Messrs. Weeks & Day, Phelan building. Messrs. Binder & Curtis of San Jose are the resident architects. The theatre has been leased by Messrs. Sheehan & Lurie of the Rialto Theatre, San Francisco.

Messrs. Weeks & Day are also acting as consulting architects with Mr. Eugene Mathewson of Fresno, in alterations to the old Fresno theatre owned by Mr. Cory, and which has been leased to the Hippodrome management.

Apartment Houses Planned

An unusually large number of applications for apartment house permits were filed with the San Francisco Building Inspector the past month, due to the fact that the architects wished to secure permits under the old law, the new law going into effect September 1st.

Among those who applied for permits were C. A. Meussdorffer, who intends to build a four-story apartment house for himself on Jones street, north of Sutter; Mr. J. F. Dunn, who has plans for a five-story reinforced concrete apartment house to be erected on Leavenworth, north of Geary street for Mr. C. Cross, and Messrs. Wm. H. Crim, Jr., and Hamilton Murdock, for a three-story frame apartment house for Sophia Brotherton on Broadway, east of Gough street. Mr. Albert Schroepfer has also prepared plans for a four-story brick apartment house to be erected on the south side of Sutter street, east of Jones, for Mr. Louis Stoff.

Healdsburg High School

Mr. William H. Weeks has completed plans for a group of school buildings for the Healdsburg Union High school district. The group will include an administration building containing 25 class rooms and a combination assembly hall and gymnasium, a domestic science building and a manual training building. Construction will be of reinforced concrete with terra cotta tile roof. Bonds amounting to $100,000 have been voted.

Nathaniel Blaisdell Busy

Mr. Nathaniel Blaisdell, 255 California street, is among San Francisco's busiest architects. Recent work in his office is a $20,000 theatre and store building for Menlo Park, two-story Class C addition to the Isaac Upham building at Pine and Battery streets, San Francisco, and a gate lodge at Menlo Park for Mr. Charles Holbrook.

Planning Palo Alto Homes

Mr. Charles S. Kaiser, Mechanics Institute building, San Francisco, has plans for three new homes to be built in Palo Alto. One is a large two-story house for Mr. A. C. Whittaker, Professor of Economics at Stanford University; another is for Miss Elizabeth Church, and a third is for Mr. F. C. Swearingen. The houses will vary in cost from $5,000 to $10,000.

Planning Numerous Dwellings

Messrs. Wood & Simpson, French Bank building, San Francisco, are preparing plans for a number of cottages and bungalows to be built at Bay Point, Contra Costa county, for the Pacific Electric Metals Co.

Railway Building

Mr. Carl Werner of San Francisco has completed plans and work has been started by day labor on a $50,000 administration building at Alturas, Modoc county, for the Nevada-California Oregon Railway Company. The building is designed in the Mission style, two stories, 50x100 feet, and will be constructed of native stone faced with cement. This is one of a group of five new buildings for the company.

Haslett Warehouse Company to Build

Mr. H. J. Brunnier, C. E., Sharon building, San Francisco, has prepared plans for a three-story brick warehouse to be erected at Beale and Bryant streets, San Francisco, for the Haslett Warehouse Company. The drawings call for a structure 137½x206 feet and equipped with four elevators, gravity chutes and modern warehouse equipment. The building will cost approximately $100,000.

$10,000 Claremont Residence

Mr. Wm. C. Hays, First National Bank building, San Francisco, has completed working drawings for a two-story and basement frame and stucco residence and garage to be built at Claremont for Mr. Edward A. Soule, a San Francisco building material dealer. The house will cost in the neighborhood of $10,000.

Moore & Scott Iron Works

The Moore & Scott Iron Works are preparing to build their new plant at the foot of Adeline street, Oakland, from plans by Engineer Leland S. Rosener. A machine shop of Class "A" construction and covering a ground area 120x250 feet will be the first of a group of structures to be put up.

Planning Fresno Building

The informal competition for plans for a Class "A" store and office building at Fresno for Judge Frank Short has resulted in the selection of Mr. Kenneth MacDonald of San Francisco as architect of the building. For the present only two stories will be built, but the design will be made with a view to carrying six or eight additional floors later. About $175,000 will be expended on the work now.

Civic Center Building

The San Francisco Board of Supervisors have passed a resolution favoring the appointment of an unbiased jury of out-of-town architects to pass upon the Bliss & Faville plans for the new State Building. These plans are now practically completed according to reports from the State Engineer's office, Sacramento.

Union League Club May Have New Building

It is reported that the Union League Club which is now occupying the three upper floors of the building at Powell and O'Farrell streets, San Francisco, is arranging to have a building erected for its exclusive occupancy, the club to lease the building for a term of years. The lease of its present quarters expires in December, 1918. Mr. Louis Stanton of the Chicago, Milwaukee & St. Paul Railroad Company is chairman of the committee having the matter in hand.

Palo Alto High School

Revised figures from the contractors who submitted low bids for various items for the construction of a group of buildings for the Palo Alto High School, failed to come within the available funds, and the architects, Messrs. Allison & Allison of Los Angeles, were instructed by the Board to prepare new drawings and specifications and readvertise for bids.

Low Bidder for Aqueduct

Low bid for the construction of a tunnel aqueduct, Mountain Division, Hetch-Hetchy system, San Francisco Municipal water supply, was submitted by Messrs. Robert C. Storrie & Company, for approximately $9,253,368. Only two other bids were received, one from the Lindgren Company and the other from the Healy-Tibbitts Company. The two latter firms bid on a portion of the work only. All bids have been rejected.

Modesto High School

Bids have been received for the construction of a group of buildings for the Modesto high school district at Modesto, from plans by Messrs. De Remer & Hewitt, Title Insurance building, Los Angeles. The contract has been let to E. E. Etherton & Company, San Francisco, for $136,950.

Ten-story Office Building

Mr. Lewis P. Hobart, Crocker building, San Francisco, has applied for a permit to construct a ten-story Class A addition to the Newhall building at California and Battery streets, San Francisco. The structural steel and grading for this building already have been let and contracts will be let shortly for other parts of the work.

Municipal Bathhouse for Marysville

City Engineer W. H. Meek of Marysville is preparing plans for a one-story municipal bathhouse to be erected on "D" street, near 9th, at an estimated cost of $12,000. Construction probably will be frame and building will contain dressing rooms, office and a concrete tank about 100 feet square.

Yosemite Valley Work

Mr. Edward J. Symmes, Pacific building, San Francisco, is now dividing his time between San Francisco and Yosemite Valley. Mr. Symmes has been doing quite a little architectural work in the Valley the past year, and he states that the prospects for the government building a new hospital there in 1918 are very promising. Mr. Symmes is at present at work on plans for a $10,000 schoolhouse for the Yosemite School District.

Honolulu Residence

Mr. Louis C. Mullgardt, Chronicle building, San Francisco, is completing plans for a residence for Mrs. Selma C. Smith to be built at her country place in Honolulu, H. T. The house is to be constructed of native stone, with concrete floors and basement and terra cotta partitions. It will cost $50,000.

Designing Costly Residences

Mr. George H. Howard, architect, with offices in the Lick building, San Francisco, is preparing plans for two pretentious homes in San Mateo county. One will be built at Burlingame for Mr. Walter S. Martin, and the other will be built at Atherton for Mr. W. W. Stettheimer. Both houses will cost in the neighborhood of $50,000 each.

Walnut Grove Hotel

Mr. Wm. H. Weeks, 75 Post street, San Francisco, is preparing plans for a three-story and basement Class "C" hotel to be erected at Walnut Grove, near Sacramento, for Mr. Brown, proprietor of the present Walnut Grove hostelry, which latter was constructed in 1869. The new building is to have forty-five guest rooms and will cost $50,000.

Coalinga High School

Mr. Ernest Kump, Fresno architect, has completed plans and a contract has been awarded for a group of buildings for the Coalinga High School District. The group includes an academic building, gymnasium and manual training structure. The total cost of the work will be about $85,000.

Berkeley Residence

Mr. W. H. Ratcliff, Jr., has prepared plans for an attractive two-story and basement English style residence to be built in Salinas for Mrs. Austin. The house will cost approximately $7,000.

Contract for Menlo Park Theatre

Mr. Nathaniel Blaisdell, 288 California street, San Francisco, has awarded a contract for the construction of a frame and plaster theatre and store building for Mr. Chas. H. Merrill at Menlo Park, for approximately $17,000.

Electrical Department

"Doing-It-Electrically" in the Schools

By HOYT CATLIN

THE Nob Hill School in North Yakima equipped its domestic science department entirely with electric appliances during the past summer. After trying it for a month or so during the fall term, this department found electricity so satisfactory and the cost of operation so reasonable that the Pacific Power and Light Company was asked for information upon the subject of preparing electrically the noon-day hot lunches.

We found that during the previous term the school had prepared about five gallons of hot soup or cocoa per day. This had been served to the eighty pupils at a cost of one cent per cup. Not all of the children purchased the hot soup regularly.

The attention given by the teacher of domestic science to the operation of the disagreeable oil stoves occupied so much of her time that she could not give the food the care it required. At the beginning of this past fall term the officials of the school were quite dubious as to the prospects for a satisfactory hot lunch service for the coming winter. To prepare the large quantities of liquid required upon the surface burners of any ordinary electric range would have been a slow and expensive process. We recommended that we be allowed to make for the school a special soup cooker of eight gallons capacity. After some delay, the cooker was constructed and installed.

The cooker was made by placing a heavy sheet metal lining inside a wooden cabinet, this lining supporting the electric heater and the seamless granite stock kettle for the soup. Three inches of air space was left between the lining and cabinet. The kettle is supported independently of the heater, by lugs riveted to the inside of the lining. The 2000-watt, three-heat Westinghouse 10-in. heater disk is supported by four light frames which hold it so that it is in light contact with the bottom of the stock pot when it is in place. A three-way switch controlling the heater disk is fastened to the outside of the cabinet and a Hubbell receptacle placed alongside it for connection to the power circuit through a flexible cord. Two inches of asbestos boardware was placed in the bottom of the lining to prevent escape of heat downward and to eliminate the danger of charring the wood of the cabinet.

The heater disk is not connected as it is in the Westinghouse range. On full heat, the whole surface of the heater is active. On medium heat the 4-in. center is cut out. On low heat, only the middle two-ring section burns. This system is used to prevent burning of foods which would normally be over the intensely hot center. This idea has worked out perfectly in practice as no food has ever been burned in this soup cooker.

The cost of this heater complete was about twenty-five dollars.

To pay for the heater in two years and to cover all costs of making the soup — materials, electricity, etc.— the cost of the service was raised to 1½ cents a cup. This permits the school to supply a very pleasing quality of soup the year 'round.—Journal of Electricity.

Wireless Telephone Will Be Used by the Navy in War

Wireless telephony as well as wireless telegraphy will be used by the United States Navy in its war operations. A year ago, by order of Secretary of the Navy Daniels, telephone officials of the Bell system and Navy officers planned and successfully carried out a three-day mobilization of communication forces during which war conditions were simulated. Instantaneous communication was provided over the wires of the Bell system by both telephone and telegraph from the office of the Secretary at Washington to all the naval stations in the continental United States, and wireless telephone communication was maintained between the office of the Secretary and an American battleship in the Atlantic ocean.

Since that time engineers and scientists connected with the Bell system

have been working in close co-operation with officials of the Navy Department and have developed further the use of the wireless telephone in the naval service. The plans followed in the original mobilization have proven in practical operation to be as highly satisfactory as they were at that time.

The telephone and telegraph engineers, whose organizations are all represented on the telegraph and telephone committee of the Council of National Defense, have also been working with the Army and naval officials, the National Research Council and the Naval Consulting Board on many research problems of vital importance to national defense, such as telephone communication with airplanes, new wireless methods, and apparatus for detecting the presence of submarines, and important progress has been made.

A Mammoth Office Switchboard.

When the Southern Pacific Company's new office building in San Francisco is completed in November, it will be equipped with the very latest type of eight position telephone switchboard. This will be one of the largest—if not the largest—private branch switchboards on the Pacific Coast and will permit of additional sections being added from time to time as the company may require. In addition to this, the chief operator will be provided with a supervisory position from which she can supervise the service, both incoming and outgoing, from her desk, and take care of any overflow that the regular switchboard is unable to handle expeditiously.

In the new building there is to be a switchboard with a maximum of eighty lines.

Doing It Electrically

Electrical heating blankets are now offered to those who sleep outdoors, for hospital and sick-room use, for elderly people or those with poor circulation. These blankets come as large as 6x5 feet; have three temperature controls, ranging from 82 to 112 degrees. The cost of running is almost negligible. The item of lightness as compared to much heavier bedclothes is an important consideration.

* * *

The electric furnace is the newest way to make steel. The resulting product is better than can be produced by any other method; weighs 10 per cent more than open hearth, which means that much increase in product. The grain and texture of electrically made steel is finer and more compact, has less blow-holes and soums. In 1908, there was only one electric steel furnace in the United States; now there are 150.

An electrified horsewhip has been invented which gives a far better incentive than the lash, without marking or injuring the horse in the least. A storage battery under the seat of the vehicle supplies the current for the slight shock.

* * *

One of the newest New York hotels is electrically equipped from top to bottom. Hardly an electric appliance of the many which contribute so much to happy, comfortable living has been omitted. Electric refrigerators, dumb-waiters, stoves, fans, vacuum cleaners, 'phones, calls of all description, the most improved and modern lighting, and a host of other electrical appliances. This model hostelry is called Hotel des Artistes, and, as the name implies, is especially conducted for artists, illustrators, writers, and those of allied occupations.

* * *

"Somewhere on the Atlantic," electricity is "taking in washing"—doing good work for Uncle Sam's Tars. On the supply, or "mother" ship an American electric laundry is operated, said to be the most complete and modern ever seen in that part of the world. The "boys" report that the work is perfect, and prices less than half those at home. One of the features of the ship's laundry is a complete soap factory.

* * *

The new United States battleship "Tennessee" provides enough electric current for heat, light and power to fully supply a city of 200,000 population. Everything possible is reduced to an electrical basis and hundreds of motors are installed, serving every part of the ship. Besides moving the turrets, guns, ammunition, anchor, steering, and handling everything heavy with electric cranes and capstans, ice-making, laundering and cooking, and every convenience of fans and lighting is provided electrically.

Where Are They?

The man who had made a huge fortune was speaking a few words to a number of students at a business class. Of course, the main theme of his address was himself.

"All my success in life, all my tremendous financial prestige," he said proudly, "I owe to one thing alone—pluck, pluck, pluck!"

He made an impressive pause here, but the effect was ruined by one student, who asked impressively:

"Yes, sir; but how are we to find the right people to pluck?"—Exchange

For Sale

Complete file of The Architect and Engineer of California since 1[illegible], will be sold complete or whichever [illegible] or years desired. Address this office.

The Contractor

HIS TRIALS, TRIBULATIONS AND TRIUMPHS

Advantages of the Cost Plus a Fee Contract in War Time

THE announcement that most of the military cantonments are to be built under the cost plus a percentage form of contract should serve to cause engineers to recommend some such contract for other public works in many places.

Press reports state that, in order to expedite the cantonment work, neither lump sum nor unit price bids will be called for.

This decision has led the advisory committee of the Council of National Defense to counsel the Quartermaster's Department to make contracts on the percentage basis.

In doing this all sorts of precautions and checks have been provided in order that only the ablest and most honest contractors be given contracts. To begin with, a full set of questions have been sent to all the leading contractors of the country.

They are asked to tell of the work they have done in the last three years, its size, etc. They are asked to tell how large a number of men they are prepared to keep in camps. In all a pretty complete history of their operations is required, with references.

In addition to this, confidential questionnaires have been sent to leading engineers and architects asking them about each contractor, his integrity, his reputation for finishing work on time and his equipment.

These sets of answers have been put into the hands of one of the best judges of contractors in this country. It has long been his business to judge contractors for great security and guaranty companies. He goes over the questions and then gives the Quartermaster's Department his judgment, whether in his opinion the contractor's offer is so sound that he would be willing to advise a guaranty company to go on his bond.

The contracts are made on a 7 per cent basis to cover overhead costs and contractors' compensation, with an upset limit of $250,000. Before anyone decides this is too much and quotes some contractor who says that he would be glad to do the work without profit, he should look more closely into the case.

On an average it is estimated that all of these contractors have an overhead charge of three and one-half per cent. This means that on a million dollar contract the contractor earns $35,000.

It is stated that the government will buy small tools and will pay rental on all heavy equipment. On jobs of $100,000 or less the contractor's percentage fee will probably be 10 per cent. On jobs of $500,000 or more it will be 7 per cent. For jobs between $100,000 and $500,000 percentages between 7 and 10 per cent will be allowed.

In addition to the time saved through adopting a cost plus a fee contract, there will probably be a saving in cost at this time when a reliable contractor's price is apt to include a pretty high insurance against financial risks.

The chief objection to the cost plus a fee contract is that it does not provide sufficient incentive for a contractor to exert himself to the limit to keep costs down. If, however, the contractor's fee is made dependent on his efficiency as a manager, this objection vanishes. We have suggested elsewhere that it would be feasible to penalize the contractor up to the full extent of his fee for failure to perform the labor within specified unit costs. Also it would be feasible to increase the fee if the labor costs were less than a specified amount per unit of work.

Some form of cost plus a variable fee contract can be contrived for any given class of construction work. Wherever work is being held up because of high contract prices, engineers should address their attention to the "cost plus" form of contract.—Engineering and Contracting.

Wybro

Reg. U. S. Pat Office

The Panels that are as good as they are famous.

244 Varieties of
Wybro Quality Panels

If it's a **different kind** of a panel you require, you will find it among the WYBRO family of 244 varieties.

WYBRO PANELS come in all woods and sizes. Each variety is fully as good and worthy of the name.

Whatever "kind" of a panel you need is listed in our Wybro catalogue, which is free to you for the asking.

White Brothers 5th and Brannan Sts. San Francisco

The Honest Contractor Who Fails

"HE'S an Honest Man, and he knows how to do good work, but I never recommend him to the owner because his work is slow, and he is apt to delay the other contractors and put them and myself to no end of trouble," said an architect a few days ago.

The architect was referring in this instance to a plastering contractor, but his criticism might have been applied with justice to a percentage of contractors in other lines of construction work—plumbers, steamfitters, electricians, painters, masons, carpenters, tinners, and roofers.

In every large community there are always a few contractors of whose honesty and of whose workmanship no one entertains any doubt, but who find it very hard to get work. Architects are slow in recommending them. They are generally men who have not been in business for themselves very long, and they do not remain in business very long. They are soon crowded to the financial wall by other men, possessed of no more honesty, with no more industry, and with no better understanding of their trade.

But the unsuccessful man lacks the quality that is probably best described by the homely word, "Foresightedness."

In the first place, he may lack the ability to get satisfactory work out of the men whom he employs. It is probably true that much of the labor in any class of construction work is done by men who primarily feel no great responsibility in their tasks, no desire to economize, and a wish to get through the eight or nine hours of labor with as little personal effort as possible. One man is able to take a force of workmen and infuse it with a spirit of ambition, and a desire to accomplish good results. Another gets 25 per cent less work from a similar organization. The force of personality accounts in part for the difference. But not entirely. Imbue any working force with the feeling that the "boss" is slack in his methods, that he has little shortcomings of his own in the way of efficiency, and the organization quickly absorbs the same spirit to a greater degree.

The contractor who fails to have material at the "job" when the workmen are ready to use it, who delays till Tuesday when he could have begun on Monday, who fails to provide tools that are adequate or satisfactory in quality, who permits little vexatious delays to occur that could have been avoided by foresight and care, not only invites financial loss, but creates in the mind of the architect and the owner the belief that he is a "good man to avoid," when another contract is to be awarded.

The stopping of a steam shovel or a machine tool for a few minutes during the working day disarranges the work, causing confusion and delay that is directly responsible for a monetary loss, a good deal larger than is at first apparent. The "foresighted" man sees that all tools are overhauled at frequent intervals to insure their being in efficient condition. Inspection of work should be frequent. The work should be planned in advance so that there will be no condition which causes some of the men to stand and wait for the others, but that work shall at all times advance swiftly and smoothly.

The contractor who devotes time and thought to planning his work in advance so there will be a minimum of friction and a maximum of accomplishment is the contractor who will find his bank balance growing, and will have the satisfaction of knowing that he is considered in the "preferred" class by architects and owners. He is the man who, when he answers the telephone bell, hears a voice saying:

"I've got a set of plans over here that I wish you would figure."—Improvement Bulletin.

O'HARA & LIVERMORE

Designers of

INTERIOR DECORATION

IN ALL ITS BRANCHES

- STUDIOS AT -

522 Sutter Street
SAN FRANCISCO, CAL.
Tel. Sutter 284

253 E. Colorado Street
PASADENA, CAL.
Fair Oaks 2173

When writing to Advertisers please mention this magazine.

A Model Kitchen Equipment

The Architect and Engineer is pleased to here present the result of experiments conducted by the Hoosier Kitchen Cabinet Store, along lines suggested by a number of leading architects.

As shown in the illustration, this is a very simple method of adapting the well-known principle so long in use in filing systems in the form of sections. These sections, or "auxiliary units" as they are called, may be used in a large number of combinations, making them adaptable to almost any kitchen side wall. As may be seen, any number of these units may be added to accommodate wall spaces and by omitting the upper sections of the side units additional cupboard space can be utilized under windows and alongside the kitchen sink.

The Hoosier Company has placed a large contract on the Pacific Coast for a quantity of these units in order to furnish them at a minimum price.

Full-size detail drawings will be furnished to architects who desire to enlarge or change the application of the auxiliary units to meet any requirements. We do not doubt that many architects will be glad to avail themselves of this service, which is free, as it will enable them to install Hoosier Cabinet Units in the kitchen equipment and thus get the benefit of the working parts, which is a result of eighteen years' specializing by the Hoosier Company.

Stockton Paper Mill

Plans have been prepared and work is about to be started by Messrs. Macdonald & Kahn, Rialto building, San Francisco, for a paper mill at Stockton for eastern capitalists. Fireproof materials are to be used in the construction.

WALL PAPER ✤ Uhl Bros.
PHONE KEARNY 255 38 O'Farrell Street, San Francisco

LIGHT — POWER — TELEPHONE INSTALLATIONS

STANDARD ELECTRICAL CONSTRUCTION CO.

MANUFACTURERS OF

SWITCHBOARDS AND PANEL BOARDS

Contractors and Engineers

60 NATOMA STREET, SAN FRANCISCO, CAL.

Phone Sutter 894

WE USE EXCLUSIVELY "TRUMBULL"

PLAINVILLE SWITCHES

HIGH GRADE

ELECTRICAL CONSTRUCTION WORK

FOR BUILDINGS

BUTTE ENGINEERING AND ELECTRIC CO., 683-87 Howard Street,

SAN FRANCISCO, CAL.

PACIFIC FIRE EXTINGUISHER CO.

ENGINEERS AND CONTRACTORS

Heating and Ventilating, Electrical Installations, Fire Extinguishing Apparatus

THE GRINNELL AUTOMATIC SPRINKLER

Main Office. 507 MONTGOMERY STREET, SAN FRANCISCO, CAL.

Branch Offices:
217-218 Colman Building - - - - - - - - - Seattle Wash.
504-505 McKay Building - - - - - - - - - Portland, Ore.
826 Paulsen Building - - - - - - - - - - Spokane, Wash.
563 I. W. Hellman Building - - - - - - - - Los Angeles, Cal.

Ask the Architect-He Knows

where you can get good and suitable lighting fixtures for your new building. He is interested in having the lighting brighten (not deaden) the effects he has sought to accomplish in his architectural design. He will, doubtless, advise you to go to ROBERTS MFG. COMPANY, 663 Mission Street, San Francisco, where you will find the largest stock to select from, all at equitable prices.

Sound-Deadening Floors and Walls in Schoolhouses

The necessity of having walls and floors of schoolhouses as well as of other buildings sound-proof is too well recognized to admit of serious argument, and next to light and ventilation, is probably the most important item in schoolhouse construction. It is a part of the problem of acoustics which presents itself in two phases, namely, the conveyance of sound and its confinement within its own sphere of usefulness. The necessity of preventing the sounds of one schoolroom from penetrating into another is now generally recognized and has led to exhaustive inquiry into the various methods and materials to be employed for accomplishing it. It is known that the ordinary plaster and timber construction constitutes a very imperfect barrier to the passage of sound, plaster being at all times a poor non-conductor while the timbers often increase the difficulties, each one forming a medium to convey the sound. It is, therefore, necessary to line the floors and walls with some material that will break up and absorb the sound-waves and which will also at the same time meet other requirements, such as durability, reasonable cost, hygienic properties, etc.

As being of interest along this line is the twenty-four page booklet profusely illustrated with half-tone engravings of schoolhouses scattered all over this country as well as some abroad, which has just been issued from the press by Samuel Cabot, Boston, Mass., and bears the suggestive title of "Schoolhouse Acoustics." Every building illustrated in the booklet is said to be sound-proofed with Cabot's Deadening "Quilt," which is composed of a peculiarly laminated matting of cured eel-grass held in place between two layers of tough manila paper by "quilting," whence its name "Quilt," which is the registered trade mark of the material. Eel-grass was selected for the filling after exhaustive tests of that and other materials for four very important reasons. First because the blades are long and flat, and when felted as they are in the "quilt," they form minute dead air spaces, making the absorbent cushion which is necessary to break up and dissipate the sound-waves and which is said to be impossible with a round fiber. Second, because eel-grass contains silicon to a large extent in place of the carbon of plants that grow in the air and therefore is an effective fire-resistant. Third, because it is indestructible by decay and repels insects and vermin; and fourth, because it is very tough and does not lose the elasticity which is so necessary for non-conducting purposes.

Raise the Worth of Your Work

Make the buildings you create *last*. Make them better looking. Make them waterproof. And do it with Bay State Coating.

Bay State Brick and Cement Coating fulfills its name worthily. Just a coat or two completely covers, protects and beautifies *any* brick, cement or stucco wall.

You have completed your plans. From foundation to roof the house is just as you want it. You are anxious to see the building finished. Won't you dread to see the first storm leave its imprint on the walls? To realize that from then on wet weather will rapidly destroy your handiwork!

Bay State Coating comes in white and a variety of tints. Puts a good complexion on old or new walls, and keeps it there. Specify "Bay State."

We should form a Society for Prevention of Wall Destruction—*you* should be a charter member. We will be glad to send you our booklet No. 6, which tells of thousands of buildings all over the country, coated and protected with "Bay State." A sample of any tint you want will help you decide whether you will join us.

JAMES HAMBLY & SONS
San Francisco, - 268 Market Street
Los Angeles, 447-449 East Third Street

JONES-MOORE PAINT HOUSE
San Diego, Cal.

BAY STATE
Brick and Cement Coating

To Be "Low Bidder" Not Always Our Aim.

Our most particular attention is given to prompt and skillful handling of all electrical work of any nature with "QUALITY AND SERVICE GUARANTEED."

Our nation-wide organization and large experience in this field assures you always of fair estimates and absolute satisfaction.

F. E. NEWBERY ELECTRIC CO.

163 Sutter St. (413 Lick Bldg.) San Francisco, Phone Sutter 521

ASBESTOS PROTECTED METAL FOR ROOFING AND SIDING

For permanent industrial buildings of all classes.
Economical — Low maintenance.
Permanent without paint under the most severe conditions of service.

ASBESTOS PROTECTED METAL CO. Ask for Bulletin.

First National Bank Bldg., PITTSBURGH San Francisco Office, Hobart Bldg.

C. JORGENSEN & CO.

BUILDING MATERIALS

Phone Kearny 2386 20 Crossley Building, SAN FRANCISCO

LUXFER
SIDEWALK LIGHTS
TRANSOM PRISMS

TOCH BROS.
"LIQUID KONKERIT"
"TOXEMENT"

JAS. P. DWAN, Hearst Bldg., San Francisco Phone Douglas 3199

DESIGNERS OF FIXTURES

GOOLD & JOHNS

ELECTRICAL CONTRACTORS AND ENGINEERS

Phone 1-1-1-1 113 S. California St., STOCKTON, CAL.

San Francisco, Cal. Oakland, Cal. Los Angeles, Cal.

NEPAGE, McKENNY CO.

Electrical Engineers and Contractors

Phone Sutter 2369 149 New Montgomery St., San Francisco, Cal.

H. W. Fincke Geo. C. Derby

IDEAL HEATING & ENGINEERING CO.

FAN SYSTEMS FOR HEATING AND COOLING

General Sheet Metal Work Warm Air Furnaces
Ideal Air Washers Blow Pipe Systems

PHONE MARKET 3708 102 ERIE STREET, SAN FRANCISCO

MULLEN MANUFACTURING CO.

BANK, STORE AND OFFICE FIXTURES—CABINET WORK OF GUARANTEED QUALITY—BAR FIXTURES DESIGNED, MANUFACTURED AND INSTALLED

Telephone Market 8692 Office and Factory: 64 Ralsch St., Bet. 7th and 8th, San Francisco

GENERAL VIEW, PLANT OF SOUTHERN CALIFORNIA IRON & STEEL COMPANY, LOS ANGELES.

Where Steel Bars are Rolled and Shaped for the Reinforced Concrete Industry

THE scarcity of structural steel, due to its unprecedented consumption by our own and foreign governments, has given reinforced concrete first call for the better class of building construction. With the increased use of this material has come an unusual demand for reinforcing material and the manufacturers are experiencing difficulty keeping up with the orders. The old-time shops have doubled and tripled their capacity and new concerns are constantly entering the field. That reinforced concrete construction is here to stay the most skeptical engineers are frank to admit. The fact that this material is now universally accepted in all important government, state, municipal and railroad work—for buildings, bridges, tunnels, etc.—is evidence indisputable of its economy, safety, permanence and adaptability.

Southern California was awake to the possibilities of concrete construction sooner than many other localities, and one of the first great structures to be built of this material in Los Angeles was the Auditorium, designed by Architect Chas. F. Whittlesey. The success of this building was followed by the erection of others of equal magnitude, and then came the construction of several large bridges and the Los Angeles aqueduct.

An industry that has made good in contributing to the growth of reinforced concrete in Southern California, Arizona and tributary country, is the Southern California Iron & Steel Company, a concern that has developed from very modest proportions into one of the largest and most influential steel mills on the Pacific Coast. Where a couple of years ago its output was almost infinitesimal and practically local, today it is shipping material by the trainload all over the western states and even to foreign countries. The secret of this is high-class organization, efficiency and ability to handle big orders with the utmost speed. The plant covers five or more acres in the heart of the manufacturing center of Los Angeles. The executive offices are close by the plant in a new brick building at Mateo and Fourth streets. Splendid railroad facilities are at hand, with spur tracks, which permit loading and unloading of raw and finished material at all times. For months the company has been running three shifts, giving employment to 400 men and turning out 600 tons of reinforcing rods, bolts, nuts and rivets a week. The plant is right up to date, being equipped with the latest type of machinery and open hearth furnaces. The products of the company consist of open hearth steel bars (rounds, squares, and flats), Havemeyer deformed bars (round and square), square twisted steel bars (for reinforcing concrete work), ingots and billets, machine bolts, carriage bolts, nuts, lag screws, cone and button head rivets, hot pressed nuts, etc. The company also makes to order anchor rods, pole steps, U-bolts, track bolts, eye bolts and ground rods. A galvanizing shop is operated for hot or cold work and where anything can be galvanized "from a tack to a 12-inch pipe."

The accompanying photographic views give a fair idea of the magnitude of the plant. One picture shows the rolling

ANOTHER VIEW OF FACTORY, SHOWING BOLT WORKS AND GALVANIZING PLANT, SOUTHERN CALIFORNIA IRON & STEEL COMPANY, LOS ANGELES

mill and the superior transportation facilities; another picture shows the bolt and nut works and galvanizing plant, and a third photograph is an interior view of the bolt works.

The Havemeyer bar, which is featured by this company, has been designed to meet the requirements of bond, and at the same time the important economical requirement that in the deformation no strength or metal is wasted.

The deformations of the Havemeyer bar are designed so that a constant cross-sectional area is maintained. The square bar has a series of projections and depressions in conjunction with the plain square section of the bar, the projections on the sides equaling the depressions on the corners. The round bar has projections staggered on alternate faces, giving the same result, and no metal is wasted to secure the strongest grip in concrete.

The projections and depressions are rolled longitudinally with the bar, there being no sharp angles to form points of weakness in the steel, and the full tensile strength of all the metal is developed at every point.

The irregularities or deformations on the bar offer more than sufficient resistance or mechanical bond in the con-

INTERIOR OF BOLT WORKS, SOUTHERN CALIFORNIA IRON & STEEL COMPANY, LOS ANGELES

Master Builders Method

Master Builders Method — with Master Builders Concrete Hardner — is standard practice the world over for the construction of concrete floors that are Dustproof, Wearproof and Waterproof. More than 21,000 satisfied users. Over 80,000,000 sq. ft. in every-day use. Makes the ideal type of floor for all buildings where floor service is essential and the elimination of dust is necessary. Send for our "Primer"—a complete text book on the subject of better concrete floors. Sent FREE, without obligation.

THE MASTER BUILDERS COMPANY

Makers of Master Builders Concrete Hardner; Master Builders Red Concrete Hardner; Master Builders Black Concrete Hardner; Roadyte Concrete Hardner for Concrete Roads; Sanseal Liquid Concrete Hardner.

Main Office and Works: CLEVELAND, OHIO.

AGENTS

Colvin & Hoskins
Spokane, Wash.
Raymond C. Grant
Helena, Mont.
Sam Hunter Co.
Seattle, Wash.
F. S. Cook & Co.
Portland, Ore.
C. Roman Co.
San Francisco, Cal.
A. E. Banks,
Los Angeles, Cal.
S. A. Roberts & Co.
Salt Lake City, Utah

crete, and form a perfect bond, independent of surface adhesion.

Tests have shown that Havemeyer bars develop maximum efficiency, and will not slip or pull out of the concrete.

Havemeyer bars will not split the concrete, will not twist or turn under stress, and have no sharp edges to start a fracture in the concrete.

The Havemeyer round and square bars are unique in that their projections and deformations enter directly into the tensile strength of the bar and no metal is wasted. The contractor will use the same amount of steel when using Havemeyer bars as if plain bars were used.

One of the largest contracts now under way in San Francisco is the construction of Pier No. 1 on the San Francisco water front. Contractor J. D. Hannah is using the Havemeyer bar on this work with splendid success.

The officers of the Southern California Iron & Steel Company are:

A. C. Denman, Jr., president and general manager; E. G. Pratt, vice-president; A. W. Grier, secretary; S. K. Rindge, treasurer.

The San Francisco representative of the company is Mr. W. B. Kyle, with offices in the Call-Post building.

Austin Mixers Give Satisfaction

The Municipal Engineering & Contracting Company of Chicago, which has selling agents and warehouse facilities in the principal Coast cities, its San Francisco representatives being J. H. Hansen & Co., Balboa building, have recently published some attractive and valuable literature descriptive of the company's splendid line of concrete mixers. Every engineer and contractor has doubtless heard of the 150-mile concrete road system of Wayne county, Michigan. These roads are notable for the excellence of their construction at minimum cost. The fact that Austin mixers were used exclusively on this work speaks well for their superior qualities. Nine Austin plants were employed—a plant consisting of engine and boiler, mounted on heavy steel trucks, with or without distribution boom. One of these pavers is shown in the catalogue at work on San Pablo avenue, Oakland, California.

Following is a sample testimonial from one of Fort Wayne's big contractors:

Municipal Engineering & Contracting Co.,
Railway Exchange Bldg., Chicago, Ill.

Dear Sirs:—We herewith enclose our check and voucher in payment of the attached invoice covering No. 0 Batch Mixer. Kindly receipt same and return.

We have found this mixer satisfactory in every respect and it completely fulfills our expectations.

Yours very truly,
GRACE CONSTRUCTION & SUPPLY CO.,
Martin J. Grace, Gen. Manager.

DO YOU USE ANY HIGH GRADE

CABINET or HARDWOODS?

WE MAKE A SPECIALTY OF THEM

PRIMAVERA, MAHOGANY, KOA, JENISERO, OAK, ASH, ETC.

DIECKMANN HARDWOOD CO.

Beach and Taylor Streets, SAN FRANCISCO

A CONVENIENT CORNER OF THE REFERENCE BUREAU

Building Material Exhibit Establishes Service Department

THE management of the Building Material Exhibit, 77 O'Farrell street, San Francisco, announces the inauguration of a Service Department for architects, contractors and owners. This departure is intended to benefit those needing immediate information on all matters pertaining to building, including materials, cost data, etc. The working force of the Exhibit has recently been strengthened by the addition of two experienced officials—Mr. M. Feintuch as vice-president and Mr. Douglas Allan as manager of the Information Department and Reference Bureau. Both are live, energetic men and they should materially increase the efficiency of the Exhibit. Mr. Allan contributes the following, which gives a good idea of the scope and intent of his department:

"This department has been organized and will be completely equipped with the ultimate and clearly defined object of making it a recognized bureau of information for the architect, contractor and property owner and will have among its appointments metal adjustable shelving, cabinets, lockers, reference indexes and every needed modern detail that tends to service.

"As far as possible, all printed and collected data and information upon every detail of building material, equipment, appliances for the building, construction detail, etc., which are manufactured in all parts of the United States will be filed in the most effective manner for ready reference.

"All subject matter will be classified under cross index systems, so as to allow reference thereto by class, grouping, title, trade mark and manufacturer.

"Samples of material furnished by subscribers will be loaned interested persons, receipts taken for same and their return obtained.

"Such technical and reference books as will be deemed of value will be purchased for the files of the department and added to from time to time and the leading trade journals and magazines allied with the interests of the department will be found in a reference room, where tables, chairs and stationery will be furnished for those who desire them.

"A system of prospect or 'follow up' notices will be maintained and these mailed either to the main office of the manufacturer or to the local representative, thereby placing him in close touch with the prospective buyer.

"Added to the service of all these essentials will be found all the adjuncts of a trained business organization in a department whose individual manager will give it exclusive attention, with as many assistants as will be required to properly give the right degree of service.

"It will be readily seen that with the organization of this invaluable department, architects will be saved much annoyance heretofore experienced by re-

ROBERT W. HUNT JNO. J. CONE JAS. C. HALLSTED D. W. MCNAUGHER
ROBERT W. HUNT & CO., ENGINEERS
BUREAU OF INSPECTION TESTS AND CONSULTATION
251 KEARNY ST., SAN FRANCISCO
NEW YORK LONDON CHICAGO PITTSBURGH ST. LOUIS SEATTLE TORONTO MEXICO CITY
CEMENT INSPECTION
INSPECTION OF STRUCTURAL AND REINFORCING STEEL
REPORTS AND ESTIMATES ON PROPERTIES AND PROCESSES
CHEMICAL AND PHYSICAL TESTING LABORATORIES

peated calls from manufacturer's salesmen often made at inopportune times.

"This Information Department places at the disposal of the architect a free service, which he may use for whatever specific purpose his demands may require, and for the manufacturer the Information and Reference Department will effect a considerable saving in dollars and cents by avoiding the costly duplication of samples in innumerable architects' offices.

"In no way does the Information and Reference Department act as a manufacturer's agent. This department simply files samples, specialties, catalogues, etc., for the free use of architects, engineers and their clients, real estate managers and purchasing agents, etc., presenting same impartially to those interested when they are interested, either in their offices or those of the department.

"A sufficient number of telephones will be installed in the department, thereby insuring instantaneous service in the matter of information and requests, and architects who are not familiar with this character of service are urged to avail themselves of it without the least hesitation or feeling that any obligation whatsoever is incurred."

Schaw-Batcher Company Expands

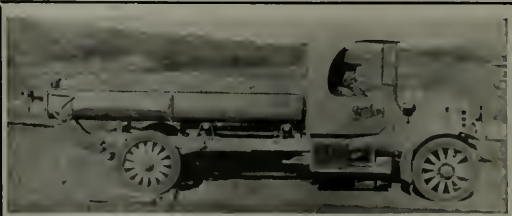
The Schaw-Batcher Company, which has been quite active in the manufacture of steel pipe, tanks, etc., for the past year or two, recently announced its intention to enter the shipbuilding business and will construct steel cargo steamers at its South San Francisco works.

The order for steel for vessels has already been placed in the East and work has begun on the task of converting the plant into a shipyard. Dredging and construction work has begun for the three marine ways that are to be installed. Contracts for steel ships to the value of between $10,000,000 and $11,000,000 are said to be already assured.

The force at the plant, which is now one of the largest and best equipped steel plate shops on the Pacific Coast, is to be increased. The company has acquired eighty-nine acres of land on which the ways will be constructed and a canal dredged north of the present plant on the tidelands.

According to Mr. C. L. Moorman, vice-president, the plant will be ready for the laying of the first keel within ninety days. The first steel shipments are expected here within the present month. The expansion is to be permanent and the company will do a general shipbuilding business.

Besides Mr. Moorman, the officers of the company are Mr. John H. Batcher, president, and Mr. F. R. Veach, secretary and treasurer.


STERLING MOTOR TRUCKS
A complete line in stock for immediate delivery.
EDWARD R. BACON COMPANY, Pacific Coast Agents
51-53 Minna Street, San Francisco Telephone Sutter 1675

KEWANEE
GARBAGE BURNERS AND BOILERS

YEOMANS
BILGE PUMPS
EJECTORS
HOUSE PUMPS

LOUDEN
SANITARY
BARN EQUIPMENT

CALIFORNIA HYDRAULIC ENGINEERING & SUPPLY CO., 80 Fremont St., S. F.

Phone MISSION 4405

P. R. WARD Formerly Ward & Goodwin
GENERAL CONTRACTOR
981 GUERRERO STREET SAN FRANCISCO

ONE PIECE SANITARY DRAINBOARDS, SINKBACKS, FLOORS, WAINSCOTING, ETC.
GERMANWOOD FLOOR CO.
Phone West 4009 1621 EDDY STREET, SAN FRANCISCO

HOWARD CO.
CEMENT, ROCK, PLASTER, GRAVEL, BRICK and SAND
Phone Lakeside 27 1st and Market Sts., Oakland

G. W. COURTNEY
CONTRACTOR
Phone Franklin 4800 160 EDDY STREET, SAN FRANCISCO

L. G. BERGREN & SON
GENERAL CONTRACTORS
347 CALL BUILDING SAN FRANCISCO, CAL.

PLUMBING HEATING
NEIL H. DUNN
CONTRACTOR
786 ELLIS STREET S. F. Phone Franklin 2187

J. B. CROWE
Glass of All Kinds
1372-74-76 TURK ST., SAN FRANCISCO Tel. West 1398

LANDSCAPE ARCHITECTS
NEAL T. CHILDS COMPANY Phone Sutter 4933
WE PLAN HOME GROUNDS AND REALTY TRACTS 68 POST STREET
TREE SURGERY AND CONSULTING FORESTRY SAN FRANCISCO

A Concrete Hardener Without the Use of Paint for a Filler

An interesting figure in the building-material circles of the Coast is Mr. J. L. Goffette, who has recently come to California from Belgium by way of Canada.

Professor Goffette has devoted his life to the study of cement, concrete and agglomerate materials in general, and his record of achievements has been accomplishd while practicing as a constructing engineer and as a consu'ting expert for the Belgian and Canadian governments and for the Canadian Pacific Railroad.

He has several inventions to his credit, two of which have been taken up by San Francisco business men, after long tests, and placed upon the market. These are the so-called "Goffette preparations," for waterproofing and for hardening concrete, brick-work, natural and artificial stone, etc.

The claim for these preparations is, simply and boldly, that they give perfect and permanent results, and the faith of the manufacturers is evidenced by their willingness to give long-period maintenance bonds covering the satisfactory performance of their goods when properly used.

Professor Goffette has, it is claimed, achieved success by abandoning the methods heretofore followed. He does not rely upon a paint or "filler." He gets his permanent results by bringing about a supplemental crystallization in the material itself; not by adding anything to the mix, but by brushing or spraying on to the finished work a liquid of high penetrative power which fills all voids by crystal'zation, becoming integral with the original material.

The process is simple and the preparations inexpensive. Tests covering periods of two to three years fail to show the slightest deterioration by weather, smoke, gases or microscopic organisms. The longer the period, the harder and more solid the surfaces treated by the Goffette preparations appear to be.

Two strong points claimed for the preparations by the manufacturers, in

Meese & Gottfried Company
SAN FRANCISCO, SEATTLE, PORTLAND, LOS ANGELES

CHARLES T. PHILLIPS
CONSULTING ENGINEER
PACIFIC BUILDING — SAN FRANCISCO
HEATING VENTILATION WIRING ILLUMINATION

SAN FRANCISCO'S NEW CITY HALL

is the nucleus of the Civic Center which is being established in the city by the Golden Gate. In design and appointments it is worthy of the new spirit in municipal development. Architects Bakewell & Brown specified ARMCO Iron for all sheet metal work, including some notable skylights.

The Iron That's Made To Last

is more and more surely the choice of those who plan permanent structures. The unequalled purity and evenness of Armco Iron and the care and skill devoted to every phase of its production are the basis of its long service life.

ARMCO IRON Resists Rust.

AMERICAN ARMCO IRON

The trade mark ARMCO carries the assurance that iron bearing that mark is manufactured by The American Rolling Mill Company with the skill, intelligence and fidelity associated with its products, and hence can be depended upon to possess in the highest degree the merit claimed for it.

THE AMERICAN ROLLING MILL COMPANY

MIDDLETOWN, OHIO

Licensed Manufacturers under Patents granted to the International Metal Products Company

ARMCO Iron Sheets, Plates, Roofing, Pipe, Gutter and Metal Lath

Pacific Coast Sales Office — Monadnock Building, San Francisco, other Branch Offices in New York Chicago Pittsburgh Cleveland, Detroit, St. Louis, Cincinnati, Atlanta and Washington, D. C.

AN AMPLE STOCK OF ARMCO IRON IS CARRIED AT SAN FRANCISCO

addition to their efficiency for their main purposes, are first, that they have no effect on the color or texture of the material upon which they are used; second, that on concrete or artificial stone which is to be painted, the use of the Goffette waterproofing destroys the "suction," as painters call it, so that the paint can be applied smoothly and at a high saving in cost.

The Goffette hardener, in laboratory tests by the Smith-Emory Co., is shown to increase the tensile and compressive strength of concrete enormously—doubling the strength even of neat cement, and increasing that of sand-and-cement mixtures from 200 to 500 per cent.

It is claimed to put a flint-hard surface on even the softest concrete floors, resisting the wear of even heavy trucking and stopping "dusting" altogether.

The manufacture of the Goffette preparations has become a California industry, a factory having been established in San Francisco. The general sales agency is in the hands of the Goffette Sales Association, Monadnock building, San Francisco. Mr. R. E. G. Keene, a well-known local contractor and materials-dealer, has secured the selling agency for Northern California.

Denison Tile in Demand

Seventy thousand Denison hollow tile are being used for partition work in the new First National Bank building at Montgomery and California streets, San Francisco, Mr. George W. Kelham, architect. A large number of tile have also been shipped for use in the Girls' Dormitory under construction at Stanford University from plans by the same architect. A tile order was recently filled by the Cannon-Phillips Company, Sacramento, for fourteen barracks buildings for the United States Government at Fort Shafter, Honolulu. The Cannon-Phillips Company was recently incorporated with Mr. D. A. Cannon president, and Mr. J. B. Phillips, vice-president. The company has taken over a brick plant in South Sacramento, and is now manufacturing the Denison tile, in addition to common, buff and red pressed brick and smooth and ruffled brick. Silo blocks are also being made, and this promises to develop into an extensive and profitable industry.

Well-known Decorators Move

The Tormey Co., finding that their rapidly growing business makes additional shop space necessary, have moved to 1042 Larkin street, between

Heavy service demands
California Redwood
BLOCK PAVING
Economical—costs less to lay and has longer life than other pavings.
Durable—will stand the heaviest traffic and outlive asphalt, brick or concrete.
Noiseless, dustless, sanitary.
Maintenance costs practically nothing.
Easy on the feet of employes.
And Redwood contains a natural preservative—does not require artificial preservatives to insure long life.
Resists rot and fire. Permanent in shape.
Write today for free booklet, "California Redwood Block Paving," and full information.
CALIFORNIA REDWOOD ASSOCIATION
723 CALL BUILDING, SAN FRANCISCO
Basement of Palace Hotel, San Francisco Paved with California Redwood Block Paving.

PLUMBING GOODS

GOODS OF QUALITY HM&S

OF QUALITY

REFINEMENT and ELEGANCE Distinguish the Bath room Fixtures shown in this picture. It is a photograph of one of several Bath rooms which may be seen under Water Pressure at our New Up-Town Display Room, 64 Sutter Street, San Francisco. Architects and others interested in High Grade Plumbing Fixtures are Cordially Invited to Call.

Holbrook, Merrill & Stetson

DEALERS IN

PLUMBERS' SUPPLIES, IRON PIPE AND FITTINGS, METALS
STEAM, WATER AND HOT AIR HEATING APPARATUS
STOVES, RANGES AND KITCHEN UTENSILS

Main Office and Warehouse

SIXTH, TOWNSEND AND BLUXOME STREETS, SAN FRANCISCO

MODERN PLUMBING FIXTURES

HAINES, JONES & CADBURY CO.
MAKERS OF PLUMBING SUPPLIES
1130-1144 RIDGE AVENUE PHILADELPHIA
BRANCHES - SAVANNAH AND SAN FRANCISCO
San Francisco Office and Showroom
857 Folsom Street

H. H. LARSEN, 101 Woodland Ave. N. LARSEN, 230 Haight St.
H. H. LARSEN & BRO.
MASONS and BUILDERS
Phone Douglas 4249 Office 62 POST ST., Room 331, San Francisco

ROBERT TROST PHONE MISSION 2209
General Building Contractor
We Specialize in High Grade Work and Employ Skilled Labor in every Branch of the Building Industry.
26th and Howard Streets SAN FRANCISCO

Atlas Heating and Ventilating Co., Inc.
ENGINEERS and CONTRACTORS
STEAM AND HOT WATER HEATING, FANS, BLOWERS, FURNACES, POWER PLANTS--SHEET METAL WORK
Phone Douglas 378 Fourth and Freelon Sts., Bet. Bryant & Brannan, SAN FRANCISCO.

J. W. BENDER ROOFING & PAVING CO.
(Members of Builders Exchange, 180 Jessie St. General Contractors Assn., 110 Jessie St.)
WATERPROOFING AND COMPOSITION ROOFING
MASTIC AND BITUMEN PAVING
General Offices:
576 Monadnock Building San Francisco Telephone Douglas 4657

HEATING VENTILATION
Automatic Sprinkler Systems
FLOOR AND WALL TILING
PLUMBING SHEET METAL WORK
SCOTT CO., INC.
SUCCESSOR TO JOHN G. SUTTON CO.
243 MINNA STREET SAN FRANCISCO

BARRETT & HILP
Concrete Construction & General Contractors
SHARON BUILDING SAN FRANCISCO SUTTER 4598

Dolan Wrecking & Construction Co.
(D. J. DOLAN)
Lumber, Lath, Nails, Shingles, Doors, Windows and Plumbing Supplies, New and Second Hand
Phone Market 4264 Office and Yard, 1607-1639 MARKET ST., SAN FRANCISCO

Geary and Post, San Francisco, where they will house a large stock of wall papers as well as a full equipment of machinery, tools, etc., for carrying on their extensive contracting lines.

Mr. Tormey has executed many contracts, big and little, for leading architects and general contractors, and his concern enjoys a good reputation for excellent workmanship combined with equitable prices.

Brininstool Company Has New Representative

Architects and the building trade in general in San Francisco and the Bay cities will be interested in the appointment of Mr. Walford Cammer as permanent representative of the Brininstool Company for the San Francisco territory. Mr. Cammer will have his headquarters at 115 Babcock building, 310 California street. Mr. Cammer is a man of wide experience in the paint line and his extensive knowledge of the industry undoubtedly will make him a valuable addition to the local trade. Mr. Cammer will endeavor to popularize the Brininstool products, particularly the San-a-cote and Vel-va-cote lines for interior wall finishes, and Elasticon, a roof paint with a five-year guarantee.

Buttonlath System of Fireproof Construction

The Buttonlath system of fireproof construction is growing in favor. It is not an experiment. Buttonlath is an improved lathing material embodying the best features of metal lath and plaster board with their undesirable characteristics eliminated.

The button construction is said to provide a positive mechanical key to hold plaster on a rustproof lathing material. A wall thus constructed is fire-retarding, sound deadening and heat insulating. The use of Buttonlath saves labor, plastering material, construction time, insurance and repairs, according to its manufacturers.

Buttonlath, it is claimed, also prevents lath stains, rusting, spread of fire, echoing, and transmission of noises. It has been found to be an especially valuable sound-deadening material for the construction of walls in school buildings where echoing and the transmission of noises can easily disrupt the proper conduct of classes.

Buttonlath construction is approved by all the State Building Laws as well as the laws of every large city of the Coast States. It not only conforms to every statute but its economical construction gives it an undeniable superiority over other forms of construction

BEAVER BLACKBOARD
BEAVER GREENBOARD
SCHOOL FURNITURE
AND SUPPLIES—
OFFICE, BANK AND
COURTHOUSE FURNITURE—
THEATRE AND
AUDITORIUM SEATING
Rucker-Fuller Desk Co.
677 Mission St., SAN FRANCISCO, CAL.
120 So. Spring St., LOS ANGELES, CAL.
432 - 14th Street - OAKLAND, CAL.

JOHN CHANNING
EXPERIENCED IN PHOTOGRAPHY
FOR ARCHITECTS AND ENGINEERS
Commercial
PHOTOGRAPHY
All Branches
TEL. FRANKLIN 8875
Dean Building, San Francisco

Architectural
Scale Models
EXECUTED IN
PLASTER and PLASTICINE
B. V. Gerow
509 23rd Avenue San Francisco

Western Vacuum Supply Co.
CALIFORNIA AGENTS FOR
Palm Vacuum Cleaners
ANY SERVICE
ANY CAPACITY
Plants Noiseless in Operation
Office and Demonstrating Room
1125 Market St. Telephone Park 4294
Rialto Theatre Building San Francisco

When writing to Advertisers please mention this magazine

No More Imperfect Operation of Wood Drawers

Probably no single thing has been the cause of more irritation to the general public than the imperfect operation of wood drawers. Every change in the weather seems to be reflected in their operation, and comparatively little difference is found between good and ordinary cabinet work as far as the binding and sticking of the drawer is concerned.

A solution to all of this trouble has been created by the Reliance Ball Bearing Door Hanger Company's ball-bearing drawer slide. These slides can be easily fitted to any drawer and when once installed they absolutely remove all of the old troubles. It makes no difference how much or how little weight is placed in the drawer. The operation is so easy that the drawer can be pulled out its full length with a minimum of effort.

These slides are rapidly making themselves popular, and are already in use in most of the newer homes and banks, etc., where efficiency is an object.

A cut of this slide can be seen in the advertising pages of this issue.

Precedence Does Not Guide the Pacific Plumbing Fixture Companies.

In the last few years these companies have grown from an organization employing about a hundred men and selling only in California, Oregon and Washington to their present size—doing an international business.

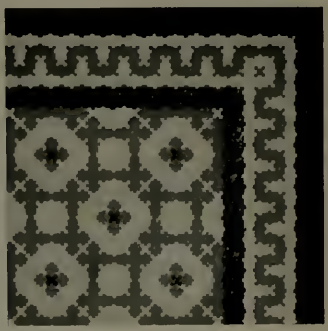
In China, Australia, Russia and almost every part of the Orient these companies do an enormous business—which is growing larger and larger every month.

The high quality and modern designs of all Pacific Plumbing Fixtures have caused them to fairly dominate the Oriental field, for the architects were quick to specify Pacific Plumbing Fixtures so as to make sure that their clients would get the highest quality of plumbing fixtures.

The splendid organization of the Pacific Plumbing Fixtures Companies has helped their success. They learned each country's customs by sending a representative to visit it and study its business methods and the types of buildings being erected in each country.

These illustrations show the sales force and the show room of the north China representative, the American Sales Corporation of Shanghai.

The American Sales Corporation is typical of the firms that represent the Pacific Plumbing Fixtures Companies throughout the Orient and enables them to dominate.



The Elevator Floor—

Whether in Office Building, Hotel or Department Store is subjected to an enormous amount of wear and tear.

Specify

Interlocking Rubber Tiling

and you've provided your client's building with a Durable, Economical, Practical material that is bound to give satisfaction.

Stock on hand for immediate delivery.

New York Belting and Packing Co.

New York

San Francisco Branch
519 MISSION STREET

Phone Douglas 1837

Small booklet of designs mailed on request.

SALES FORCE, PACIFIC PLUMBING FIXTURES, IN CHINA

SHOW ROOM, AMERICAN SALES CORPORATION, PACIFIC PLUMBING FIXTURES, SHANGHAI, CHINA

You will always remember your Eastern Trip

IF YOU TRAVEL VIA
"THE SCENIC ROUTE"

WESTERN PACIFIC
DENVER & RIO GRANDE

THROUGH THE FEATHER RIVER
CANYON AND ROYAL GORGE

2 — TRAINS DAILY — 2

— FOR —

SALT LAKE CITY, DENVER,
KANSAS CITY, ST. LOUIS,
CHICAGO

AND

ALL EASTERN POINTS

Ask Any WESTERN PACIFIC Agent
or
BODE K. SMITH, General Passenger Agent,
961 Mills Building, San Francisco

New York by Rail and Ocean

Fare Same as All Rail
But Includes Meals and
Berth on Ship

Take

"Sunset Limited"

(No Extra Fare)
From SAN FRANCISCO
(Third Street Station)

5:00 P. M.

via

Sunset Route

to

NEW ORLEANS

and there connect with

Southern Pacific's
SPLENDID OCEAN LINERS

To

NEW YORK

For Fares and Berth Reservations,
ASK AGENT

SOUTHERN PACIFIC

Write for folder on the "Apache Trail" of Arizona

Schaw-Batcher Co.
Pipe Works

RIVETED STEEL PIPE
PRESSURE TANKS
STORAGE TANKS
WELL CASING

ALL KINDS HEAVY STEEL PLATE WORK

356 Market St., San Francisco Works, South San Francisco

When writing to Advertisers please mention this magazine.

OROSI UNION HIGH SCHOOL, OROSI, TULARE COUNTY, CALIFORNIA
ERNEST J. KUMP, Fresno, Architect.

Covered with

∴ SPANISH ∴ TILE

Manufactured by

Los Angeles Pressed Brick Company

LOS ANGELES, CALIFORNIA

UNITED MATERIALS COMPANY

CROSSLEY BUILDING, SAN FRANCISCO

Distributers for Northern California

Planning the Private Garage

BOWSER Oil and Gasoline Storage Systems

Are a necessity always, to make the garage complete — make it safe — convenient — and a saving proposition.

BOWSER Equipment is Fire-Proof, Theft-Proof, Dirt-Proof and Loss-Proof. Because it is built to meet underwriters' inspections — with every convenience and oil saving device.

Write or 'phone us at once for complete information.

S. F. Bowser & Co., Inc., Fort Wayne, Ind.

San Francisco Office: 612 Howard Street, Telephone Douglas 4323

Sales Offices in All Centers — Representatives Everywhere

THE BRUNSWICK-BALKE-COLLENDER CO.'S

WHALE-BONE-ITE

REG. PAT. OFFICE

CLOSET SEATS

CUT SHOWS No. 16 91 SEAT
CONSTRUCTION OF B WHALE BONE-ITE SEAT
A—NOTE THE COUNTER LAYER OF LAMINATION THIS RUNS ACROSS SEAT
B—RUNS LENGTHWISE

Sanitation — Durability

LIFE-LONG SERVICE combined in this hard rubber product. Note construction and that heavy thick rubber covering which is impervious; acid proof; one composite piece; does not crack or craze.

When cleaned with alcohol is made absolutely aseptic

Specify Whale-Bone-Ite Toilet Seats and give your client a fixture that positively fills the requirements.

Styles for all Standard Type Bowls.

Note Patent Concealed Type Hinges

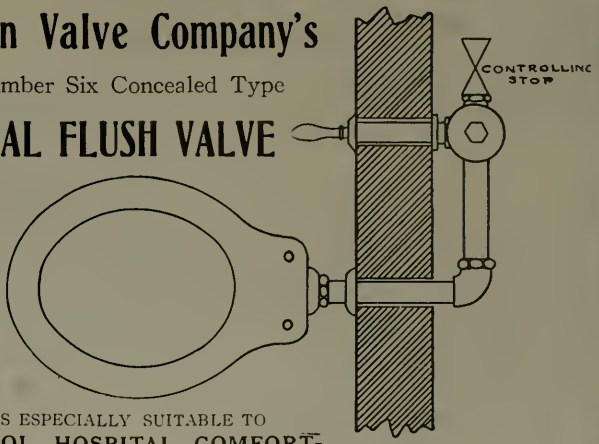
THE BRUNSWICK-BALKE-COLLENDER CO. 623 SO. WABASH AVE CHICAGO

Sold by all Leading Plumbing Jobbers

Sloan Valve Company's

Number Six Concealed Type

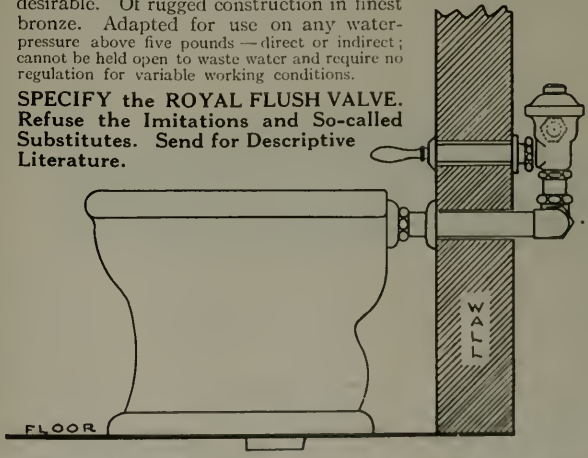
ROYAL FLUSH VALVE



IS ESPECIALLY SUITABLE TO

SCHOOL, HOSPITAL, COMFORT-STATION AND INSTITUTIONAL installations where utility chambers are available and vandal-proof equipment is desirable. Of rugged construction in finest bronze. Adapted for use on any water-pressure above five pounds — direct or indirect; cannot be held open to waste water and require no regulation for variable working conditions.

SPECIFY the ROYAL FLUSH VALVE. Refuse the Imitations and So-called Substitutes. Send for Descriptive Literature.



SLOAN VALVE COMPANY, Chicago, Ill.

or 624 Wells Fargo Bldg., San Francisco, Cal.

Representatives in all principal cities.

RELIANCE Ball Bearing Drawer Slides--The Slides you have been looking for!

A drawer slide that will not merely operate easily—(at the slightest pull of the finger)—irrespective of weight of drawer and contents, but will also pull out all the way—it's entire depth.

In the Home these slides are ideal for linen drawers, cedar drawers, and others of the many such conveniences.

In Banks, Libraries, Hospitals and other large institutions it fills a vital need, as is proved by the repeated requests for such a device that we have received from architects, builders, and owners. Send for data or consult our catalog in "Sweet's".

Reliance Ball Bearing Door Hanger Co.

Grand Central Terminal : : : : : NEW YORK

Technical High School Oakland, California
Jno. J. Donovan, Supervising Architect

C W DICKEY JOHN J DONOVAN

"Wolverine Brand" Maple Flooring

used in the above building, one of several in the City of Oakland and "Satisfactory," says the Architect. *Read his letter:*

C W DICKEY AND JOHN J DONOVAN
ARCHITECTS
414 THIRTEENTH STREET
OAKLAND, CALIFORNIA

August 24, 1917

Mr. F. W. Jones,
"The Architect & Engineer"
San Francisco, Cal.

My dear Mr. Jones:-

I have your communication of the 23rd relative to the satisfaction given by the "Woolverine Brand" Maple Flooring used in the various schools, and I beg to assure you that same has given satisfaction.

Very truly yours,

JJD:S

STRABLE MANUFACTURING COMPANY
511-545 First St., Oakland

HOTEL WHITCOMB

AT THE

CIVIC CENTER

OF

SAN FRANCISCO

¶ Free Garage for Guests.

¶ Dinner in the Arabesque Room, one dollar.

¶ Dancing in the Sun Lounge every Evening except Sunday.

¶ Room with bath, one-fifty and up.

¶ American and European.

J. H. VAN HORNE, Manager

PHONE FRANKLIN 5598

THE TORMEY CO.
Versatile Decorators

General Painters
Wall Paper

1042 Larkin St., San Francisco, Cal.

The McGilvray Stone Company
MASONRY AND STONE CONTRACTORS
OPERATING
Duntrune Quarry, at Sites, Colusa County, Cal.

The McGilvray Raymond Granite Co.
CONTRACTORS
for and Dealers in Granite Work of Every Description
Quarries at Raymond, Cal.

Offices, 634-666 Townsend Street, San Francisco

C. DRUCKER J. C. JAMES

JAMES & DRUCKER

PLUMBING—HEATING
CONTRACTORS

Phone Market 275 — 450 Hayes Street San Francisco

MARK-LALLY CO.

PLUMBING and STEAM SUPPLIES

"PERFECTION"
FLUSH VALVES

SHOWROOMS AND OFFICE
235-249 2nd St., San Francisco
CALIFORNIA

OAKLAND SAN JOSE — Branches — FRESNO STOCKTON

Phone Douglas 3224

Hunter & Hudson
ENGINEERS

Designers of Heating, Ventilating and Wiring Systems. Mechanical and Electrical Equipment of Buildings.

729 Rialto Bldg., San Francisco, Cal.

Phone Sutter 2419

JOHN MONK

GENERAL
CONTRACTOR

316 Sharon Bldg. San Francisco

Phone Sutter 1687

THE RIGNEY TILE CO.

Successors to

CALIFORNIA TILE CONTRACTING CO.

ESTIMATES FURNISHED

Sheldon Building
1st and Market Sts. SAN FRANCISCO

"BLAZING" THE TRAIL

We've been doing it for many years—giving the Sportsman Better Value for Quality than he ever before received. *"Value at a Fair Price"* in everything for the Sportsman.

The Ellery Arms Company
583-85 MARKET ST
SAN FRANCISCO, CAL

SEND FOR CATALOG *The Sign of Quality*

National Surety Company of New York

ASSETS OVER $12,000,000.

The bonds of this Company are accepted by the United States Government in larger amounts than any other Surety Company in the World.

PACIFIC COAST DEPARTMENT,
105 MONTGOMERY STREET,
SAN FRANCISCO, CAL.
Frank L. Gilbert, Vice-President.
Phone, Sutter 2636

KEWANEE WATER SUPPLY SYSTEMS

A Perfect Water Supply to Country Homes, Hotels and Parks.

SIMONDS MACHINERY CO.
117-121 New Montgomery St., San Francisco

Interior Decorations a Specialty
Drapes, Sketches, Color Schemes Furnished on Request

Golden Gate Decorating Co.

704 Polk Street, at Eddy, San Francisco. Tel. Prospect 2685
R. L. McQUADE, Manager

Expert Designers in Home Decorations

House Painting, Graining, Glazing
Expert Paper Hanging
Apartment and Hotel Work a Specialty
Prompt Service—All Work Guaranteed

A. J. FORBES & SON

Established in San Francisco in 1850

Office and Factory, 1530 FILBERT ST., S. F.
Builders Ex. Box 236

Bank, Store and Office Fittings

Special Furniture and Interior Woodwork

MAGNER BROS.

PAINT MAKERS

Floratone Flat Wall Paint
Mabro Concrete Paint
Concrete Floor Paint
Mabro Stipple Paint
Mabro Enamels and Enamel Undercoaters

419-421 Jackson Street,
SAN FRANCISCO, CAL.

"You can hold this Thermostat in your hand"
The Smallest efficient Thermostat on the Market today.

Our ever increasing list of school house installations is our proof positive of the success of the

JOHNSON
(Heat Humidity)
CONTROL

A few of our installations are shown in this issue of the Architect and Engineer, including the

LOS ANGELES HIGH SCHOOL
MARTINEZ GRAMMAR SCHOOL
LODI GRAMMAR SCHOOL
WATSONVILLE HIGH SCHOOL
COLUSA HIGH SCHOOL
WOODLAND GRAMMAR SCHOOL
SANTA CLARA HIGH SCHOOL
WEST BERKELEY SCHOOL
UNION HIGH SCHOOL, Suisun

You Can Reach Us Overnight

Johnson Service Co.

MILWAUKEE, WISCONSIN

604 Citizens Bank Bldg.,
Los Angeles

149 Fifth Street,
San Francisco

THE FISH FUEL SYSTEM

The Safest, Cleanest, Hottest Fuel on Earth

This SYSTEM supplies Heat, Light and Power at Lowest Cost. A Commercial Plant in operation at 50-54 – 8th St., San Francisco. Telephone Market 4070.

UNION GAS-ELECTRIC COMPANY

PALACE HOTEL SAN FRANCISCO

VAN EMON ELEVATOR CO.

Incorporated

Electric (1-1 and 2-1) Gearless Traction Elevators, Electric Geared Elevators, Full Automatic Electric Elevators and Dumb-Waiters, Hydraulic, Belt and Hand Power Elevators for Every Service

Telephone Sutter 3540 54 Natoma Street, San Francisco

Architects and Building Contractors

THE BINDING OF YOUR MAGAZINES and PERIODICALS IS OUR SPECIALTY

Expert Plate and Map Mounting

THE HICKS-JUDD COMPANY

BOOKBINDERS

51-65 FIRST STREET SAN FRANCISCO, CAL.

August F. Fick Albert E. Fick

FICK BROTHERS

PAINTERS, PAPER-HANGERS AND DECORATORS

Dealers in Paints, Oils, Varnishes, Glass

475 HAIGHT ST., San Francisco

Phone Park 4428—Res. Park 2148

When writing to Advertisers please mention this magazine.

Color in Architecture—

The tendency today is to put more color into our buildings — inside and out. Architects are keenly interested in any material that will add color to their work, and at the same time possesses some structural value.

The above cut represents the 2-inch series Glass Brick together with sectional view. The glass facing is at least ⅜-inch thick. The glass face extends beyond the concrete 1 16-inch. This provides a shoulder to hold the mortar joint in place and enables the mason to use a liberal mortar spread between the body of the bricks and at the same time obtain a thinner joint at the exposed surface. The concrete body is the same size as the standard size brick. This is the brick for permanent beauty, sanitary effects, and water contact. Brick is made in standard 4-inch depth also. Catalogue, showing shapes, sent on request.

Glass Brick—

has been found to possess both artistic and structural merits. The brick is manufactured in any desired tone—bright or subdued—and experiments have demonstrated its practicability as a substitute for Clay Brick for Exterior Walls of Hotels, Apartment Houses and Hospitals; also a splendid substitute (and far more Economical) for Glazed and Enamel Brick and Tile for Light Courts, Swimming Pools, Mausoleums, Bakeries and Garages.

In addition to Glass Brick we handle Glass Wall Tile, Glass Floor Tile and Glass Base.

California Glass Brick Company

General Sales Office
228 GRANT AVENUE

SAN FRANCISCO, CAL.
Phone, Garfield 2042

"FIRE—A CRIME"

We are equipped with two Pacific Coast Factories to manufacture
METAL DOORS—Tin, Kalamein, Composite, Hollow Steel and Bronze,—Swinging, Sliding, Folding, Elevator, Van Kannel Revolving Doors, and Wilson's Steel Rolling Doors.
METAL WINDOWS—Underwriters, Hollow Metal of all kinds, Kalamein, Bronze and Steel Sash.
☞ See the SIMPLEX METAL WINDOW.

United States Metal Products Co.

OF THE PACIFIC COAST
555 Tenth St., San Francisco 750 Keller St., Los Angeles
Agents and Branches in all Coast Cities.

POPE & TALBOT

Manufacturers, Exporters and Dealers in

Lumber, Timber, Piles, Spars, etc.

Office, Yards and Planing Mills
859-869 THIRD ST., SAN FRANCISCO, CAL.
Mills, Port Gamble, Port Ludlow and Utsalady, Washington

A. S. MANGRUM, PRES. AND MGR.

MANGRUM & OTTER
(INCORPORATED)

TILING MANTELS GRATES

FURNACE AND STEAM HEATING

HOTEL AND KITCHEN OUTFITS
Stoves, Ranges, Refrigerators, Tin and Enameled Ware

Telephone, Kearny 3155 561-563 Mission St., San Francisco

DENISON INTERLOCKING TILE

and all kinds of
CLAY PRODUCTS

Phone MAIN 2028

CANNON-PHILLIPS COMPANY
Incorporated
Successors to DENISON BLOCK COMPANY

Plant North Sacramento 920 FORUM BUILDING SACRAMENTO, CAL.

STANDARD VARNISH WORKS

NEW YORK CHICAGO LONDON

SAN FRANCISCO PARIS BERLIN BRUSSELS MELBOURNE

INTERNATIONAL VARNISH CO. Limited TORONTO

LARGEST IN THE WORLD AND FIRST TO ESTABLISH DEFINITE QUALITY STANDARDS

TRADE ELASTICA MARK.

ELASTICA —No 1—

ELASTICA —No 2—

ELASTICA Floor Finish

ELASTICA Cabinet Finish

KLEARTONE Stains

Architectural Varnishes

One for every class of work

Satinette ENAMEL

IMMACULATE

BERRY BROTHERS VARNISHES DETROIT

IT STANDS TO REASON

That a client will be satisfied, if his interior trim is finished with

BERRY BROTHERS

Architectural Finishes

because they are the best made.

LIQUID GRANITE — Floor Varnish.

LUXEBERRY WOOD FINISH — For interior trim.

LUXEBERRY WHITE ENAMEL — Whitest white, stays white.

LUXEBERRY SPAR — For front doors and exposed woodwork

BERRY BROTHERS

World's Largest Varnish Makers

SAN FRANCISCO DETROIT WALKERVILLE, ONT.

FOR YOUR WATER-PROOFING SPECIFY **TIGEROIL**

EQUALLY GOOD FOR IRON, SHEET METAL OR WOOD
A POSITIVE RUST PREVENTIVE AND WOOD PRESERVER

"Tigeroil" is one of the best waterproofing coatings known. It forms a hard, elastic, non-porous coating and is not affected by either salt or fresh water.

It is a transparent preparation, easily applied to metallic surfaces by spraying, brushing or dipping. It forms a thin waterproof coating, guaranteed to exclude all moisture and prevent rust. SAMPLES AND PRICES ON REQUEST. Manufactured by

PACIFIC COAST PAINT CORPORATION
OAKLAND, CALIFORNIA

General Offices and Factory: 1111 to 1119 E. 11th St. Phone Merritt 407
San Francisco Office: 112 Market St. Phone Sutter 2690

Clinton Welded Wire Fabric

CLINTON WIRE LATH

L. A. NORRIS COMPANY

Phone Kearny 5375 — 140 Townsend Street, San Francisco

The PARAMOUNT GAS RADIATOR

The Gas Radiator Without a Fault.

Manufactured and Sold by

Modern Appliance Co.
SAN FRANCISCO
128 Sutter St. — Phone Sutter 5670

OUR LEADING CIGAR BRANDS

FLOR DEL MUNDO
ALL HAVANA TOBACCO

FLOR DE UPMANN
A MILD, PLEASING BLEND

Goldberg, Bowen & Co.
SAN FRANCISCO — OAKLAND

When writing to Advertisers please mention this magazine.

There are more Industrial Buildings under construction and being planned in California today than ever before. Many of them are concrete.

Architects and Consulting Engineers specify and Contractors Buy ONLY Clean Gravel and Crushed Rock for their Concrete Mix.

California Building Material Co.

Office, 500-4 NEW CALL BUILDING, SAN FRANCISCO

Phone Sutter 4845 Plant at Niles, Cal.

Pack your Radiator Valves with

Palmetto Twist Packing

It can be unstranded to fit any size valve. It does not get hard.

H. N. COOK BELTING CO.

317-319 Howard St. San Francisco, Cal.

MOUNT DIABLO CEMENT
COWELL SANTA CRUZ LIME

ALL KINDS OF

BUILDING MATERIALS

HENRY COWELL LIME AND CEMENT CO.

Phone Kearny 2095 No. 2 MARKET STREET, SAN FRANCISCO

AUSTIN IMPROVED CUBE CONCRETE MIXERS

Made the World's Best Records on the Panama Canal and the Los Angeles Aqueduct.

Built in ten sizes $2\frac{1}{2}$ to 64 cubic feet capacity.

"Special machines for street and road paving."

Our Mixer Capacities Based on N. A. M. M. Wet Batch Rating

Municipal Engineering and Contracting Co.

Main Office, Railway Exchange, CHICAGO

Represented by J. H. HANSEN & CO.

BALBOA BLDG., San Francisco. Telephone Douglas 776

GEO. S. MacGRUER
258 Connecticut St. Phone Park 7700

ROBERT M. SIMPSON
483 Monadnock Bldg. Phone Douglas 5889

MacGRUER & CO.

CONTRACTING PLASTERERS

Members Builders Exchange
180 Jessie St. Phone Sutter 6700

PLAIN AND ORNAMENTAL

SAN FRANCISCO

WM. F. WILSON COMPANY

MODERN SANITARY APPLIANCES

Special Systems of Plumbing for Residences, Hotels, Schools, Colleges, Office Buildings, Etc.

Phone Sutter 357

328-330 Mason Street, San Francisco.

A. C. SCHINDLER, President. CHAS. F. STAUFFACHER, Secretary

THE FINK & SCHINDLER CO.

Manufacturers of INTERIOR WOODWORK AND FIXTURES
BANK, OFFICE AND STORE FITTINGS
SPECIAL FURNITURE

218-228 THIRTEENTH ST
Bet. Mission and Howard Sts.

SAN FRANCISCO, CAL.
Telephone: Market 474

J. A. Nelson
J. C. Hurley

J. C. HURLEY CO.

Telephone
Garfield 1959

CONSTRUCTING ENGINEERS

Heating and Ventilating Systems

509-511 Sixth St., SAN FRANCISCO

Underwriters' Labelled Fire Doors and Windows— Kalamein Interior Metal Doors and Trim — Metal Corner Bead — Metal Furniture, etc.

Capitol Art Metal Co., Inc.

Manufacturer of

SHEET METAL PRODUCTS

San Francisco Office, 400-406 NEW CALL BUILDING Tel. Sutter 6553
Factory, RICHMOND, CALIFORNIA

AUXILIARY UNITS TO HOOSIER CABINET

Cupboard, Cooler, Chest and Drawer Units furnished in sections so one or all can be added to Regular Cabinet, thus making the HOOSIER a full Kitchen Equipment.

Architects and Builders will be furnished free full details, measurements and blue prints of this ideal method of equipping kitchens.

THE HOOSIER MFG. CO., New Castle, Ind.

Branch, 1067 MARKET ST., SAN FRANCISCO Telephone Market 8854

Phone Franklin 548

I. R. KISSEL

Decorator, Painter and Paperhanger

1747 SACRAMENTO ST., Bet. Polk St. and Van Ness Ave., SAN FRANCISCO

W. T. COMMARY

GENERAL CONTRACTOR

601 Crocker Bldg. Phone Douglas 2101 San Francisco

Guaranteed Results in Waterproofing and Hardening Concrete, Brick, Stone, Etc.

BY THE

GOFFETTE Preparations

A perfectly successful, simple and inexpensive method of waterproofing and hardening concrete, brick and stone has been worked out by Prof. J. L. Goffette, a Belgian chemist and engineer of high standing.

MANUFACTURED BY

J. L. GOFFETTE CORPORATION

Factory and Warehouse, San Bruno Ave., San Francisco

THE GOFFETTE SALES ASS'N
General Sales Agents
276 Monadnock Bldg., San Francisco

R. E. G. KEENE
Distributor for Northern California
110 Jessie Street, San Francisco
Phone SUTTER 3580

Territory is open for responsible state or district sales agents, correspondence invited. Address GOFFETTE SALES ASSOCIATION, 276 Monadnock Building, San Francisco.

Be-Ver Cork Tiling

DURABLE — SANITARY — MODERATE IN PRICE

Made of Powdered Cork-Rubber Binder and Co'oring Pigments.
It is Non-Slippery, Elastic and Easy to Clean.
Furnished in Ten Different Colors, which do not Fade.
A Very Attractive Flooring, and One that is Rapidly Becoming Popular.

NATURAL CORK TILING
ADAPTED TO LIBRARIES, CHURCHES, HOSPITALS, etc., where Quietness is a Requisite.

INTERLOCKING RUBBER TILING
FOR PASSENGER ELEVATORS, BANKS, ETC.

Get Our Prices

W. L. Eaton & Company
112 MARKET ST. SAN FRANCISCO

HEATING-PLUMBING

COMPLETE PLUMBING AND HEATING SYSTEMS INSTALLED IN ALL CLASSES OF BUILDINGS ALSO POWER PLANTS

GILLEY-SCHMID CO., Inc.

198 OTIS STREET, SAN FRANCISCO.
Tel. MARKET 965

Phone Franklin 1006

Alex. Coleman

CONTRACTING PLUMBER

706 Ellis Street, San Francisco, Cal.

CALIFORNIA PHOTO-ENGRAVING CO.

DESIGNERS & ENGRAVERS ILLUSTRATORS ARTISTS

BOOKLETS FOLDERS

121 SECOND ST. SAN FRANCISCO

McCRAY REFRIGERATORS

BUILT TO ORDER
FOR
Home, Restaurant, Hotel or Club

We Carry a Full Line of Stock Sizes

NATHAN DOHRMANN CO.
Selling Agents
Geary and Stockton Sts., San Francisco

W. C. DUNCAN & CO.

General Contractors

508 Sharon Bldg. San Francisco

THE SPENCER TURBINE VACUUM CLEANER

SAVES MONEY

Easily installed in old as well as new buildings—Operates by Electricity—Twelve sizes ranging from ½ to 40 horse power.

HUGHSON & MERTON CO.
AGENTS
530 Golden Gate Ave.
San Francisco

SIMPLEX STANDARD CRUDE OIL BURNERS

Safety First
Simplicity Next
Efficiency and Quality all the Time
1916 Model—Price Right

Write to
American Standard Oil Burner Co.
7th and Cedar Sts. OAKLAND, CAL.

Locks and Hardware

Representative for LOCKWOOD MFG. CO'S Builders' Hardware.

Display Rooms—7th and TOWNSEND STREETS, San Francisco

PACIFIC HARDWARE & STEEL CO.

The Granite Work on Eldorado County Courthouse; National Bank of D. O. Mills, Sacramento;—and Sen. Nixon Mausoleum, Reno, WAS FURNISHED BY

CALIFORNIA GRANITE COMPANY

Phone Sutter 2646 STONE CONTRACTORS

San Francisco Office, 518 Sharon Bldg. Main Office, Rocklin, Placer Co., Cal.
Quarries, Rocklin and Porterville Telephone Main 82

SARGENT
REG. U. S. PAT. OFF
BUILDING HARDWARE

BENNETT BROS.
514-516 Market Street
SAN FRANCISCO - CAL.

E. E. CARNAHAN
1403 McAllister St., Phone West 3608

E. S. MULFORD
1282 Sacramento St., Phone Franklin 8776

CARNAHAN & MULFORD
GENERAL CONTRACTORS
Telephone Kearny 4195 504 LUNING BLDG. 45 Kearny St., San Francisco, Cal

O. BAMANN, President ERNEST HELD, Vice-President

HOME MANUFACTURING CO.
BANK, STORE AND OFFICE FITTINGS
FURNITURE AND HARDWOOD INTERIORS
CABINET WORK OF EVERY DESCRIPTION
543 and 545 BRANNAN ST. Phone Kearny 1514 San Francisco, Cal.

PACIFIC MANUFACTURING COMPANY
MILLWORK, SASH AND DOORS
Hardwood Interior Trim a Specialty
MAIN OFFICE:
SANTA CLARA, CAL.
SAN FRANCISCO OFFICE, 177 Stevenson Street
OAKLAND.....486 Tenth Street
BERKELEY.....2143 Center Street
SAN JOSE.....16 N. First Street

MOST PRACTICAL and ECONOMICAL ARRANGEMENT for the MODERN EFFICIENT EQUIPMENT OF SCHOOL STAGES FURNISHED GRATIS
We have equipped 95% of those built in California
REFERENCES — Orpheum, Pantages or Empress Theatres, San Francisco. All Turner & Dahnken Houses. Theatres everywhere. Manual Arts High, Los Angeles. Chaffee Union High, Ontario. Santa Cruz High School. Bakersfield High School. And over one hundred others.
HIGHEST GRADE ARTISTIC WORKMANSHIP—CONTINUOUS HELPFUL SERVICE.
EDWIN H. FLAGG SCENIC CO. 1638 LONG BEACH AVE., LOS ANGELES 510 PANTAGES BLDG., SAN FRANCISCO

Thomas Elam Grover C. Elam

THOMAS ELAM & SON
GENERAL CONTRACTORS
Office, Builders' Exchange
180 Jessie Street
SAN FRANCISCO
Phone Sutter 6700

Phone Sutter 1533

FOSTER VOGT COMPANY
CONTRACTORS
411 Sharon Building SAN FRANCISCO

Pile Driving
Concrete Foundations
Fire Proofing
Building Construction

When writing to Advertisers please mention this magazine

STOCKHOLM & ALLYN
GENERAL CONTRACTORS
Telephone Douglas 4657 — Monadnock Building, San Francisco

A. KNOWLES — R. H. MATHEWSON
KNOWLES & MATHEWSON
CONTRACTORS AND ENGINEERS
Fireproof and Reinforced Concrete Construction
442 Call Bldg., San Francisco, Cal.
Phone Sutter 4712

GRAVEL-ROCK Quick Service any point in the San Joaquin Valley, Calif.
GRANT ROCK AND GRAVEL COMPANY
327-328 Cory Building — FRESNO, CALIF.

GEO. FARRELL, BURLINGAME
Res. Phone Burlingame 1045
W. N. REED, 239 PRECITA AVE.
Res. Phone Valencia 6020
FARRELL & REED
CONTRACTORS
ROOM 334 BUILDERS' EXCHANGE — Telephone Sutter 450 — 185 STEVENSON STREET SAN FRANCISCO

MILLER-ENWRIGHT CO.
SACRAMENTO, CAL.
PLUMBING SUPPLIES
STEAM and PIPE FITTINGS, VALVES, Etc.
PIPE—ALL KINDS
STEAM AND HOT WATER BOILERS
PENINSULAR HOT AIR FURNACES
Catalogues on Application

Phone Garfield 361
A. P. BRADY
BUILDER
HUMBOLDT BANK BUILDING — SAN FRANCISCO

A. LETTICH
365 FELL ST., SAN FRANCISCO
Telephone — Park 234
Plumbing

C. D. VEZEY — O. G. LAWTON
LAWTON & VEZEY
BUILDING CONSTRUCTION
PHONE LAKESIDE 91 — 206 PLAZA BUILDING, OAKLAND

CITY OF PARIS
Decorative Studios
GEARY AND STOCKTON STS. SAN FRANCISCO

Capital $1,000,000 CALIFORNIA DEPARTMENT Surplus $4,014,186.62
THE FIDELITY AND CASUALTY COMPANY OF NEW YORK
Prompt Service for
BONDS AND CASUALTY INSURANCE
203-206 Merchants Exchange Building SAN FRANCISCO, CAL.

ANY PLACE ANY TIME PROMPTLY "We Serve You"
ROBERTSON & HALL
GENERAL INSURANCE
Phone Sutter 2750 First National Bank Building, San Francisco

INSURANCE SURETY BONDS
J. T. COSTELLO CO.
INSURANCE BROKERS
216 Pine Street, San Francisco Phone Sutter 188

Telephone Sutter 5231 Member Insurance Brokers' Exchange
FRED H. BOGGS
INSURANCE
Foxcroft Building, 68 Post Street SAN FRANCISCO

CONTRACT BONDS
Fidelity and Surety Bonds of every kind.
C. K. BENNETT, Manager
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
Telephone Kearny 1452 701 Insurance Exchange, San Francisco, Calif.

PACIFIC DEPARTMENT
Globe Indemnity Company
BONDS and CASUALTY INSURANCE for CONTRACTORS
120 Leidesdorff Street Phone Sutter 2280 SAN FRANCISCO

CLINTON CONSTRUCTION COMPANY
Successors to CLINTON FIREPROOFING COMPANY
Concrete Construction
Phone Sutter 3440 140 TOWNSEND ST., near Third, SAN FRANCISCO

Phone Kearny 3526

A. H. Bergstrom
Eric Lange

LANGE & BERGSTROM
BUILDING CONTRACTORS
(ESTABLISHED 1900)

207-210 Sharon Bldg. San Francisco

S. P. McCLENAHAN
ARBORCULTURIST

GRADUATE—TREE SURGERY
SPRAYING
ORCHARD WORK

738 MERCHANTS EXCHANGE BLDG
Kearny 4457
SAN FRANCISCO

Member Builders' Exchange
180 Jessie Street
Telephone Sutter 6700

Residence 2909 California Street
Telephone Fillmore 1427

C. C. MOREHOUSE

Plain and Ornamental PLASTERING. Imitation STONE WORK of All Kinds
Exterior CEMENT PLASTERING. Metal FURRING and LATHING
MODELING and CASTING. STUCCO WORK

Office and Shop: 872 FOLSOM ST., San Francisco
TELEPHONE SUTTER 6509

ARTHUR ARLETT
BUILDING CONSTRUCTION

CALL BUILDING SAN FRANCISCO

When writing to Advertisers please mention this magazine.

MONSON BROS. Phone Market 2693
CONTRACTORS and BUILDERS
502 Clunie Building SAN FRANCISCO Shop, 1907 Bryant St.

Phone KEARNY 3021
GEORGE A. BOS
GENERAL CONTRACTOR HEARST BUILDING
CONSULTING ENGINEER SAN FRANCISCO

P. A. Palmer Peter Petersen W. L. Kelley O. G. Hoaas
PALMER & PETERSEN
Contracting Engineers
774-776 Monadnock Building SAN FRANCISCO, CAL.

Residence 2887 GREEN STREET Res. Phone, West 9451 Office Phone, Sutter 3580
P. MONTAGUE CO.
TEAMING AND GRADING
Office: General Contractors' Assn. 110 Jessie Street, San Francisco

C. L. WOLD Office Phone Sutter 4971 JOSEPH DUNN
C. L. WOLD COMPANY
GENERAL CONTRACTORS
75 SUTTER STREET, Cor. Montgomery, SAN FRANCISCO
GENERAL CONTRACTORS ASSOCIATION Phone Sutter 3580

HOUGHTON CONSTRUCTION CO.
Engineering and Construction
SPECIALIZING IN REINFORCED CONCRETE, RAILWAY and INDUSTRIAL CONSTRUCTION
Main Offices, Flatiron Bldg., San Francisco

J. D. HANNAH
Contractor and Builder
OFFICE 725 Chronicle Building Telephone Douglas 895
San Francisco, Cal. BUILDERS EXCHANGE, 180 JESSIE STREET

D. ZELINSKY & SONS
INCORPORATED
PAINTERS AND DECORATORS
420 TURK STREET, SAN FRANCISCO

UNITED STATES STEEL PRODUCTS CO.

Rialto Building, San Francisco

SELLERS of the products of the American Bridge Co., American Sheet and Tin Plate Co., American Steel and Wire Co., Carnegie Steel Co., Illinois Steel Co., National Tube Co., Lorain Steel Co., Shelby Steel Tube Co., Tennessee Coal, Iron and Railroad Co., Trenton Iron Co.

MANUFACTURERS OF

Structural Steel for Every Purpose — Bridges, Railway and Highway — "Triangle Mesh" Wire Concrete Reinforcement — Plain and Twisted Reinforcing Bars — Plates, Shapes and Sheets of Every Description — Rails, Splice Bars, Bolts, Nuts, etc. — Wrought Pipe, Valves, Fittings, Trolley Poles — Frogs, Switches and Crossings for Steam Railway and Street Railway — "Shelby" Seamless Boiler Tubes and Mechanical Tubing—"Americore" and "Globe" Rubber Covered Wire and Cables — "Reliance" Weatherproof Copper and Iron Line Wire—"American" Wire Rope, Rail Bonds, Springs, Woven Wire Fencing and Poultry Netting — Tramways, etc.

United States Steel Products Co.

OFFICES AND WAREHOUSES AT

San Francisco - Los Angeles - Portland - Seattle

HERMAN T. LUDWIG
Building Construction
Phone Valencia 2539 636 Jessie Street, Near 7th, San Francisco

GEO. W. BOXTON & SON
General Contractors
Office, 1233 HEARST BUILDING SAN FRANCISCO, CAL.
Telephone Sutter 1601

Phone Kearny 381 J. M. Morrison F. H. Masow
MASOW & MORRISON
GENERAL CONTRACTORS
BUILDING CONSTRUCTION
518-522 Monadnock Bldg. San Francisco

Res. Mill Valley, Telephone Mill Valley 240 Member of General Contractors Association
HARVEY A. KLYCE
GENERAL BUILDING CONTRACTOR
408 New Call Building, SAN FRANCISCO Phone Douglas 3280

"LENNIG SYSTEM"
ELECTRIC HEATING RADIATOR with Automatic Temperature Control
The THERMOSTAT and THERMOPILE are only sold to Manufacturers and the Trade. Not at retail and not to be installed by this company.
Contractors and Dealers in Plumbing and Heating Goods Ask for detailed information. Our proposition will interest you.
THERMIC ENGINEERING COMPANY *CLAUS SPRECKELS BUILDING, SAN FRANCISCO*

MacRORIE-McLAREN CO.
LANDSCAPE ENGINEERS and GENERAL NURSERYMEN
Office, 141 POWELL STREET, San Francisco
Nurseries at Beresford, San Mateo County

Phone Sutter 2581
LARSEN-SAMPSON CO.
BUILDING CONSTRUCTION
601 CROCKER BUILDING SAN FRANCISCO

Phone Garfield 2444
FRANK STEVENSON
PLASTERING CONTRACTOR
42 Sherwood Building 320 Market St. San Francisco

What Enamel Do You Specify?

Every architect pays particular attention to the quality of the finish produced with the enamel he has specified. For that reason he will specify only an enamel in which he has confidence and which he knows is dependable and durable.

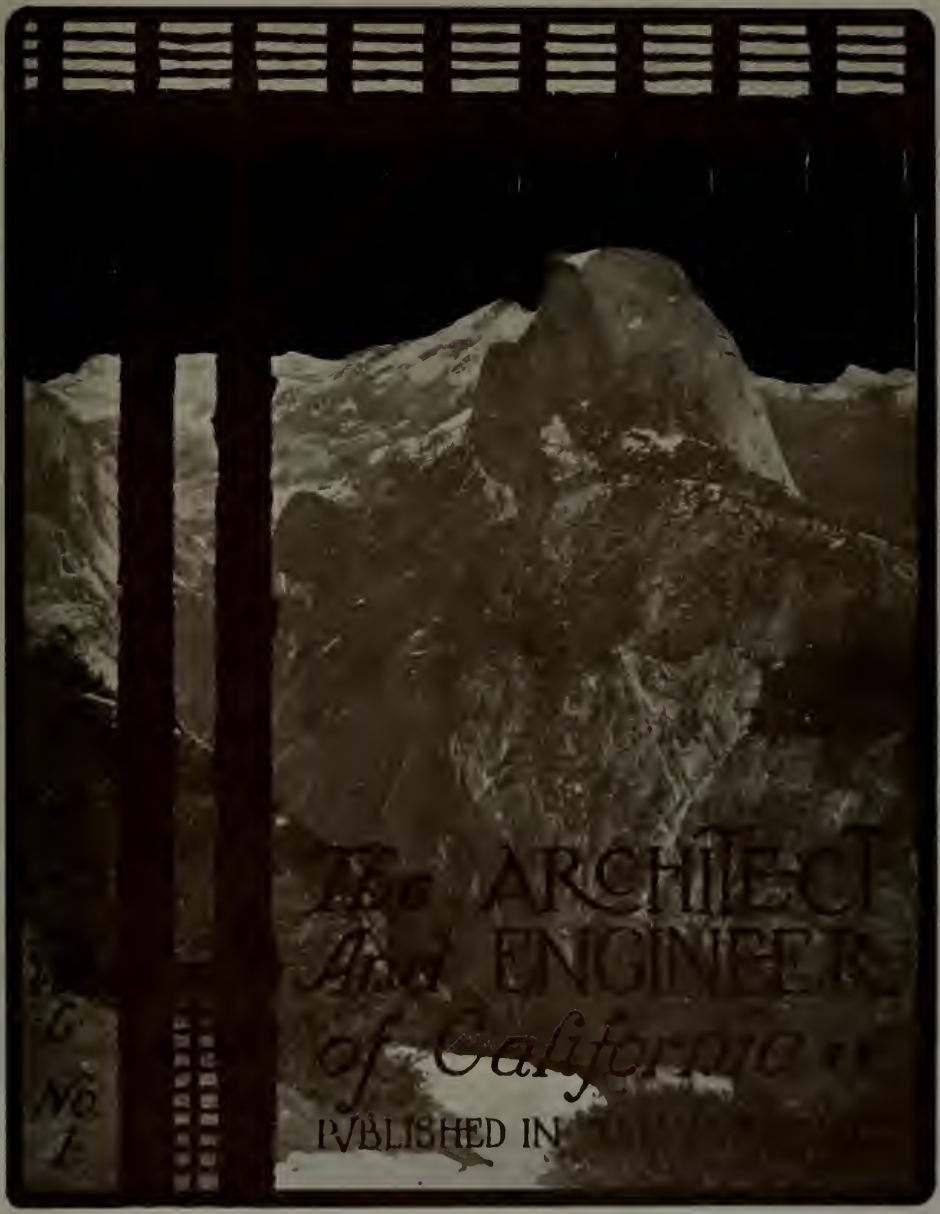
Silkenwhite Enamel

is the choice of many of the foremost architects in the West; — this is to be expected since an architect who specifies it is assured of an enamel finish to which he may point with pride for years to come.

MANUFACTURED BY

W. P. Fuller & Co.

Specialized Paint and Varnish Products For Every Purpose


The ARCHITECT
And ENGINEER
of California
PUBLISHED IN

In response to your demands for a PACIFIC one-piece built-in bath tub, we announce the Sierra.

It has no feet — rests directly on the floor and is built in the wall.

It is five and one-half inches lower than ordinary bathtubs, therefore it is easier to get in and out of.

The water cannot splash, but enters noiselessly.

The Sierra is built of one piece of Porcelain Enameled Iron Ware, glazed inside and out. It has a beautiful shining white surface.

Its massive lines are striking and simple.

PACIFIC

PLUMBING FIXTURES

FOR SALE BY ALL JOBBERS

Main Offices and Showroom,
67 NEW MONTGOMERY ST.
SAN FRANCISCO, CALIFORNIA

Factories,
RICHMOND and
SAN PABLO, CALIFORNIA

An Ideal Reversible Window

for SCHOOLS, PUBLIC BUILDINGS, APARTMENT HOUSES and RESIDENCES.

HAUSER Windows

are Watertight, Dust Proof and Easy of Operation.

The above building, St. Vincent Ferrer School at Vallejo, designed by Mr. Smith O'Brien, Architect, is equipped, as the picture shows, with

HAUSER REVERSIBLE WINDOWS

Factory and Office:

157 Minna Street, San Francisco **Phone Kearny 3706**

For Modern Store-Fronts

Our Disappearing

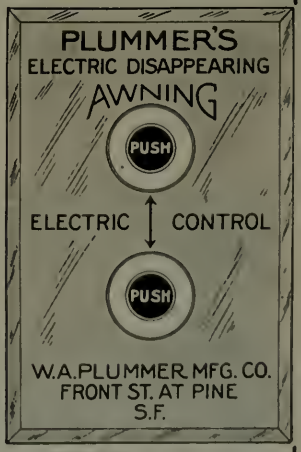
AWNINGS

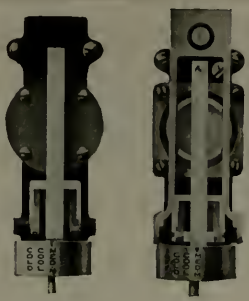
are constructed with no outside attachments below recess, above windows gears entirely concealed.

Absolutely practicable when extended and when rolled up is contained in recess 8" x 8½", with front board, which can be utilized as a sign board, covering front of recess. Operated either by crank or electric control, from any part of building.

Send for Architect's Sheet of Specifications.

The new Southern Pacific Building, San Francisco, is being equipped with **Plummer's Disappearing Awnings**





The Above Types of THERMOSTATS for VENTILATION and DIRECT RADIATION Respectively, are less than five inches long and represent

JOHNSON (Heat / Humidity) CONTROL

Write us about them

JOHNSON SERVICE CO.

800 Chamber of Commerce Bldg., Portland, Ore.
1104 White Building, Seattle, Wash.
604 Citizens Bank Bldg., Los Angeles, Cal.
149 FIFTH ST., SAN FRANCISCO, CAL.

THE PERFECTION DISAPPEARING BEDS

The Last Word in Efficiency, Simplicity and Adaptability

Full Line of Oscillating Beds, Disappearing Beds, Recess Beds, Wall Beds

PERFECTION DISAPPEARING BED CO.

Telephone Sutter 3367

739 Mission Street, San Francisco

THE HYLOPLATE BLACKBOARD

SCHOOL FURNITURE
Auditorium Seating

MAPS
GLOBES
ATLASES

C. F. WEBER & CO.

365 Market Street
SAN FRANCISCO

222-224
S. Los Angeles St.
LOS ANGELES

100 W. Commercial
Row, RENO, NEV.

124 W. Washington
Street, PHOENIX, ARIZ.

FOXCROFT BUILDING, 68 Post Street, San Francisco. Offices Single and in Suite.

Why You Should Specify KOHLER Sinks

KOHLER Sinks have same quality distinctions that make KOHLER Bath Tubs and Lavatories first choice for the well-planned home.

The designs have the hygienic features that are characteristic of all

"It's in the Kohler Enamel"

KOHLER WARE

always of one quality—the highest

KOHLER Sinks are made for right and left-hand corners and for open wall spaces. They have right, left and double sloping drainboards, and are made with and without aprons.

The whiteness of the enamel is notable in all KOHLER products, each of which has our permanent trade-mark—a guarantee of its high quality.

Architects who specify KOHLER WARE get no complaints from their clients.

KOHLER CO., *Founded 1873* Kohler, Wis.

Boston New York Philadelphia Pittsburgh Detroit Chicago Indianapolis
St. Paul St. Louis Houston San Francisco Los Angeles Seattle London

★ The KOHLER permanent trade-mark in faint blue appears on end of sink shown by star.

1 1003-A

Finished With Cabot's Old Virginia White
Hays & Hoadley, Architects, N. Y.

Another Beautiful Residence Finished With

Cabot's "Old Virginia White"

It gives the "Whitewash Effect"—a cool, soft white that is as brilliant as new whitewash, and at the same time as clean and lasting as paint, without the painty coating. For all rough lumber and some dressed lumber, as well as other whitewashable surfaces.

SAMUEL CABOT, Inc., Mfg. Chemists, Boston, Mass.

Cabot's Creosote Stains, Waterproof Cement, and Brick Stains
"Quilt" Conservo Wood Preservative, Damp-Proofing
Protective Paints, Waterproofing, etc.

Pacific Building Materials Co., San Francisco
Mathews Paint Company, Los Angeles
S. W. R. Dally, Seattle
Timms, Cress & Co., Portland

COURTEOUS CONTINUOUS RELIABLE
PACIFIC GAS AND ELECTRIC COMPANY

GAS IS THE CLEANEST AND

MOST EFFICIENT FUEL

A MATCH AND

"PACIFIC SERVICE"

WILL GIVE YOU

CONTINUOUS SERVICE

Pacific Gas and Electric Company
San Francisco District
445 Sutter Street, San Francisco, Cal.

SERVICE IN THE WEST
IS THE SAME
BIG BROAD SERVICE
AS FURNISHED NATIONALLY

National Service is large service. It means the ability to serve everywhere with all the efficiency and system made possible by a great organization.

"Standard" Plumbing Fixtures are distributed throughout the Pacific Coast on the same service ideal as holds the entire manufacturing and sales organizations to the top notch of efficiency.

Seven hundred and fifty carloads of **"Standard"** Plumbing Fixtures distributed annually throughout the Coast States, a big reserve stock in our warehouses and a representative at your call are details of our service facilities.

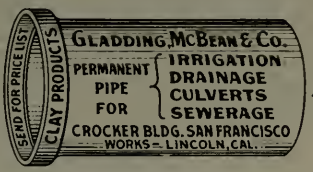
Back of these are the six immense **"Standard"** Factories, forty years of manufacturing experience and prestige of the **"Standard"** name.

May our representative have an informal interview to acquaint you with the personality existent throughout **"Standard"** dealings.

Standard Sanitary Mfg. Co.

Warehouses and Display Rooms

SAN FRANCISCO LOS ANGELES



RAYMOND GRANITE COMPANY

Incorporated

Owning and operating at Knowles, Madera County, the largest Quarry in the world.

CONTRACTORS FOR STONE WORK

OF EVERY DESCRIPTION

Designers and Manufacturers of Exclusive Monuments and Mausoleums.

Main Office and Yard:

Number 1 and 3 Potrero Avenue, - SAN FRANCISCO, CALIFORNIA.

Also at Number 612-614 Homer Laughlin Building, Los Angeles.

QUALITY SAND & ROCK CO.

Successor to SARATOGA CRUSHED ROCK COMPANY
and BAKER-MACDONALD CO.

CONCRETE ROCK AND CLEAN SHARP SAND

Crushed, Washed and Screened and in any size desired

SPECIALLY PREPARED SELF-BINDING ROCK

LOW FREIGHT RATE TO POINTS ON PENINSULAR RAILWAY

400-CUNARD BLDG., SAN FRANCISCO
Phone Douglas 2748

Quarry: Saratoga, Santa Clara Co.

703 First National Bank Building, SAN JOSE. Phone S.J.4620

S. F. Metal Stamping Works

THEOPHILE LAHAYE

ORNAMENTAL and PLAIN
Stamped, Spun, Hammered and Cast METAL

2269 FOLSOM ST. Phone Mission 2421 SAN FRANCISCO

Architects' Specification Index

(For Index to Advertisements, see next page)

ACOUSTICAL CORRECTION
H. W. Johns-Manville Co., Second and Howard Sts., San Francisco.

ARCHITECTURAL SCULPTORS, MODELING, ETC.
G. Rognier & Co., 233 R. R. Ave., San Mateo.

ARCHITECTURAL TERRA COTTA
Gladding, McBean & Company, Crocker Bldg., San Francisco.

ASBESTOS ROOFING
H. W. Johns-Manville Company, San Francisco, Los Angeles, San Diego, Sacramento.
Asbestos Protected Metal Co., Hobart Bldg., San Francisco.

AUTOMATIC SPRINKLERS
Scott Company, 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

AWNINGS
W. A. Plummer Mfg. Co., Pine and Front Sts., San Francisco.

BANK FIXTURES AND INTERIORS
Fink & Schindler, 218 13th St., San Francisco.
A. J. Forbes & Son., 1530 Filbert St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco.
Home Mfg. Co., 543 Brannan St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.

BLACKBOARDS
C. F. Weber & Co., 365 Market St., San Francisco, Los Angeles and Reno, Nevada.
Beaver Blackboards and Greenboards, Rucker-Fuller Desk Company, Coast agents, 677 Mission St., San Francisco, Oakland and Los Angeles.

BLOCK PAVING
California Redwood Association, Call-Post Bldg., San Francisco.

BOOK BINDERS AND PRINTERS
Hicks-Judd Company, 51-65 First St., San Francisco.

BOILERS
"Franklin" water tube boiler, sold by General Machinery and Supply Co., 37 Stevenson St., San Francisco.
"Kewanee," boiler sold by California Hydraulic Engineering & Supply Co., 70 Fremont St., San Francisco.

BRASS GOODS, CASTINGS, ETC.
H. Mueller Manufacturing Co., 589 Mission St., San Francisco.

BRICK—PRESSED, PAVING, ETC.
Gladding, McBean & Company, Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Livermore Brick Company, pressed, glazed and enameled, etc., Livermore, Cal.
United Materials Co., Crossley Bldg., San Francisco.
California Brick Company, Niles, Cal.

BRICK AND CEMENT COATING
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.
Wadsworth, Howland & Co., Inc. (See Adv. for Pacific Coast Agents.)
Paraffine Paint Co., 34 First St., San Francisco.
R. N. Nason & Co., 151 Potrero Ave., San Francisco.

BRICK STAINS
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

BUILDERS' HARDWARE
Bennett Bros., agents for Sargent Hardware, 514 Market St., San Francisco.
Pacific Hardware & Steel Company, San Francisco, Oakland, Berkeley, and Los Angeles.
Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.

BUILDING MATERIAL, SUPPLIES, ETC.
Pacific Building Materials Co., 523 Market St., San Francisco.
C. Jorgensen, Crossley Bldg., San Francisco.
Richard Spencer, Hearst Bldg., San Francisco.
The Howard Company, First and Market Sts., Oakland.
James P. Dwan, 1113 Hearst Bldg., San Francisco.

CEMENT
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market street, San Francisco.
"Golden Gate" Brand, manufactured by Pacific Portland Cement Co., Pacific building, San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See distributing agents in advertisement.)
Armorite, sold by W. P. Fuller & Co., all principal Coast cities.
Imperial Waterproofing, manufactured by Imperial Co., Monadnock Bldg., San Francisco.
Paraffine Paint Co., 34 First St., San Francisco.

CEMENT EXTERIOR FINISH
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co., (See list of Distributing Agents in adv.)
Concreta, sold by W. P. Fuller & Co., all principal Coast cities.

"GRANT CONCRETE MIX" The only properly proportioned mix in this market. Composed of hard, clean, fresh-water gravel, free from sand stone, and contains about 25% of crushed rock and necessary amount of sand.

WE GUARANTEE LESS THAN 25% VOIDS.

Used on many important first-class buildings and road work. Accepted on all City, State and U. S. Government work.

GRANT GRAVEL COMPANY

PLATIRON BLDG., Phone Sutter 1582, SAN FRANCISCO

An Index to the Advertisements

	Page
American Mail Chute	30
American Marble & Mosaic Co.	36
American Rolling Mill	125
American Standard Oil Burner	144
Arlett, Arthur	148
Asbestos Protected Metal Co..	117
Atkinson Windows	135
Atlas Heating & Ventilating Co.	128
Austin Cube Mixer	141
Aylsworth Agencies Co	13
Bacon, Ed. R.	121
Baker-MacDonald Co	6
Barrett & Hilp	128
Bass-Hueter Co.	3rd Cover
Bender Roofing Co.	128
Bennett Bros.	145
Bergren & Son, L. G.	123
Berry Bros.	139
Bigley, Albert S.	30
Biturine Company	36
Boggs, Fred H.	147
Bos, Geo. A.	149
Bowser & Co., S. F.	135
Boxton & Son, Geo. W.	151
Brininstool Co.	22
Brunswick-Balke-Collender Co.	135
Building Material Exhibit	26
Burlington Venetian Blind Co.	34
Butte Engineering Co.	115
Buttonlath	20
Cabot, Samuel (Inc.)	4
California Artistic Metal and Wire Co.	32
California Brick Co.	19
California Bldg. Material Co.	141
California Glass Brick Co.	137
California Granite Co.	145
California Hydraulic Engineering and Supply Co	123
California Photo Engraving Co.	144
California Plumbing Supply Co.	18
California Redwood Ass'n.	130
California Seed Co.	16
Cannon-Phillips Co.	138
Capitol Sheet Metal Works	142
Carnahan & Mulford	145
Central Iron Works	32
Childs, Neil T.	124
City of Paris	117
Coleman, Alex	144
Commary, W. T.	142
Cook Belting Co.	141
Costello, J. T. Co.	147
Courtney, G. W.	123
Cowell Lime & Cement Co.	141
Crane Co.	31
Crowe, J. B.	123
Cutler Mail Chute Co.	30
Denison Block Co.	138
Detroit Steel Products	2
Dieckmann Hardwood Co.	120
Dolan Wrecking and Construction Co.	128
Dudfield Lumber Co.	15
Duncan, W. C.	144
Dunn, Neil H.	123
Dwan, Jas. P.	117
Dyer Bros.	22
Eaton, W. L.	11
Elam & Son	145
Ellery Arms Co.	134
Fair Manufacturing Company.	32
Falvy, A.	34
Farrell & Reed	151
Fess System Co.	34
Fick Bros.	143
Fidelity & Casualty Co. of N.Y.	147
Fidelity & Deposit Co. of Maryland	147
Fink & Schindler Co., The	142
Fish Fuel System	148
Flagg, Edwin H., Scenic Co.	145
Forbes & Son	134
Foxcroft, Bldg.	2
Fuller, W. P. Co.	152
General Gas Light Co.	24
General Machinery & Supply Co.	136
Germanwood Floor Co.	123
Gerow, B. V.	133
Gilley-Schmid Co.	144
Gladding, McBean & Co.	6
Glauber Brass Mfg. Co.	18
Globe Indemnity Co.	147
Goffette Sales Ass'n.	143
Goldberg, Bowen & Co.	140
Golden Gate Decorating Co.	134
Golden Gate Ornamental Iron Co.	32
Goold & Johns	117
Grant Gravel Co.	7
Grant Rock & Gravel Co.	142
Haines, Jones & Cadbury	128
Hammond, M. E.	18
Hannah, J. D.	149
Hauser Reversible Window	1
Hicks-Judd Co.	18
Hillard, C. J., Co.	33
Hipolito Screen Co.	34
Holbrook, Merrill & Stetson	131
Home Mfg. Co.	145
Hooper Lumber Co.	35
Houghton Construction Co.	149
Howard Company	123
Hughson & Merton Co.	144
Hunt, Robt. W. & Co.	121
Hunter & Hudson	133
Hurley Co., J. C.	142
Ideal Heating Co.	117
Illinois Engineering Co.	35
Imperial Waterproofing Co.	28
Improved Sanitary Fixture Co.	23
Jackson Sidewalk Lights	14
James & Drucker	133
Jarvis, T. P.	35
Johns-Manville Co.	23
Johnson Service Co.	135
Joost Brothers	146
Jorgensen, C.	117
Judson Mfg. Co.	31
Kinnear Mfg. Co.	36
Kissel, I. R.	142
Klyce, Harvey A.	151
Knowles & Mathewson	145
Lange & Bergstrom	148
Larsen & Bro.	128
Larsen, Sampson & Co.	151
Lawton & Vezey	147
Lettich, A.	145
Livermore Fire Brick Works	19
Los Angeles Pressed Brick Co.	29
Ludwig, H. T.	151
MacGruer & Co.	142
Magner Bros.	134
Mark-Lally Co.	133
Masow & Morrison	151
Mangrum & Otter	138
Marshall & Stearns Co.	22
Master Builders	120
McElhinney Tile Co.	12
MacRorie-McLaren Co.	151
Meese & Gottfried	124
Miller-Enwright Co.	142
Modern Appliance Co.	140
Monk, John	133
Montague, P.	149
Morehouse, C. C.	148
Mortenson Construction Co.	32
Mott Iron Works	18
Mueller, H., Mfg. Co.	133
Municipal Engineering Co.	141
Musto Sons Keenan Co.	13
Nason, R. N. & Co.	12
Nathan, Dohrmann Co.	144
National Mill & Lumber Co.	17
National Surety Co.	134
Ne Page, McKenny Co.	117
Newbery Electric Co.	117
New York Belting Co.	129
Niles Sand Gravel & Rock Co.	36
Norris Co., L. A.	140
O'Hara & Livermore	119
Oak Flooring Service Bureau	25
Otis Elevator Co.	Back Cover
Pacific Building Materials Co.	31
Pacific Coast Paint Corp'n.	140
Pacific Coast Steel Company	27
Pacific Fire Extinguisher Co.	115
Pacific Gas & Electric Co.	4
Pacific Hardware and Steel Co.	144
Pacific Imp. Co.	17
Pacific Mfg. Co.	145
Pacific Porcelain Ware Co.	2d Cover
Pacific Rolling Mills	33
Palm Iron Works	31
Palmer & Petersen	149
Paraffine Paint Co.	Back Cover
Perfection Disappearing Bed Co.	2
Patent Vulcanite Roofing Co.	14
Phillips, Chas. T.	124
Phoenix Sidewalk Light Co.	9
Pioneer Paper Co.	9
Pitcher Door Hanger	17
Pittsburg Water Heater	21
Plummer, W. A. Mfg. Co.	1
Pope & Talbot	138
Portland Lumber Co.	15
Prometheus Electric Co.	18
Quality Sand and Rock Co.	6
Ralston Iron Works	33
Ray, W. S. Mfg. Co. Inc.	27
Raymond Granite Co.	6
Reliance Ball-Bearing Door Hanger	127
Rigney Tile Co.	134
Rix Compressed Air Co.	23
Roberts Mfg. Co.	115
Robertson & Hall	147
Rognier & Co.	24
Rucker-Fuller Desk Co.	130
Sartorius Company, Inc.	23
S. F. Metal Stamping Works	6
S. F. Pioneer Varnish Wks.	3d Cover
Schaw-Batcher Co.	132
Scott Co.	128
Schreiber & Sons Co.	30
Schrader Iron Works	32
Sierra Electric Constr. Co.	115
Simonds Machinery Co.	134
Simpson & Stewart	34
Sloan Valve Co.	25
Southern California Iron and Steel Co.	27
Southern Pacific Co.	132
Spencer Elevator Co.	11
Spencer, Richard	32
Spencer Turbine Cleaner	144
St. Francis Hotel	26
Standard Sanitary Mfg. Co.	5
Standard Varnish Co.	139
Stockholm & Allyn	147
Sunset Lumber Company	15
Thermic Eng. Co.	151
Tittle, H. S.	134
Tormey Co.	133
Trost, Robt.	128
Uhl Bros.	118
United Lumber Co.	15
United Materials Co.	29
U. S. Metal Products Co.	138
U. S. Steel Products Co.	150
Van Fleet-Freear Co.	10
Vitrolite Construction Co.	21
Vermont Marble Co.	24
Vogt, Alf. H.	149
Wadsworth Howland	116
Ward, P. R.	123
Walter, D. N. & E. & Co.	10
Weber, C. P. & Co.	2, 20
West Coast Wire & Iron Works	32
Western Blind & Screen Co.	20
Western Iron Works	33
Western Pacific	132
Western Vacuum Supply Co.	130
Whitcomb Hotel	34
White Bros.	114
Wilson, W. P., Co.	142
Wold, C. L., Co.	149
Woods, Huddart & Gunn	27
Zelinsky, D. & Sons	149

Roofing?

Don't take chances on inferior material. Buy the old reliable **Pioneer**

SPECIFY AND INSIST ON "PIONEER ROOFING"

PIONEER PAPER CO., Manufacturers **506-507 Hearst Bldg., San Francisco** Telephone Kearny 3788

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CEMENT EXTERIOR FINISH—continued
Pacific Building Materials Co., 523 Market St.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents in adv.)
Fuller's Concrete Floor Enamel, made by W. P. Fuller & Co., San Francisco.

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CHURCH INTERIORS
Fink & Schindler, 218 13th St., San Francisco.

CHUTES—SPIRAL
Haslett Warehouse Co., 310 California St., San Francisco.

COLD STORAGE PLANTS
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

COMPOSITION FLOORING
Germanwood Floor Co., 1621 Eddy St., San Francisco.
"Vitrolite," Vitrolite Construction Co., 34 Davis St., San Francisco.

COMPRESSED AIR MACHINERY
General Machinery & Supply Co., 39 Stevenson St., San Francisco.

COMPRESSED AIR CLEANERS
Spencer Turbine Cleaner. Sold by Hughson & Merton, 530 Golden Gate Ave., San Francisco.
Western Vacuum Supply Co., 1125 Market St., San Francisco.

CONCRETE CONSTRUCTION
Clinton Construction Co., 140 Townsend street, San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Palmer & Petersen, Monadnock Bldg., San Francisco.

CONCRETE HARDNER
Master Builders Method, represented in San Francisco by C. Roman, Sharon Bldg.
Goffette Sales Association, 276 Monadnock Bldg., San Francisco.

CONCRETE MIXERS
Austin Improved Cube Mixer. J. H. Hansen & Co., California agents, 508 Balboa Bldg., San Francisco.
Foote Mixers. Sold by Edw. R. Bacon, 40 Natoma St., San Francisco.

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Twisted Bars. Sold by Woods, Huddart & Gunn, 444 Market St., San Francisco.
Clinton Welded Wire Fabric, L. A. Norris Co., 140 Townsend St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Southern California Iron and Steel Company, Fourth and Mateo Sts., Los Angeles.

CONCRETE REINFORCEMENT—Continued.
Triangle Mesh Fabric. Sales agents, Pacific Building Materials Co., 523 Market St., San Francisco.

CONCRETE SURFACING
"Concreta." Sold by W. P. Fuller & Co., San Francisco.
Wadsworth, Howland & Co.'s Bay State Brick and Cement Coating. Sold by Jas. Hambly & Sons, Pacific Bldg., San Francisco and Los Angeles.

CONTRACTOR'S BONDS
Bonding Company of America, Kohl Bldg., San Francisco.
Globe Indemnity Co., 120 Leidesdorff St., San Francisco.
Fred H. Boggs, Foxcroft Bldg., San Francisco.
National Surety Co. of N. Y., 105 Montgomery St., San Francisco.
Fidelity & Casualty Co. of New York, Merchants Exchange Bldg., San Francisco.
Fidelity & Deposit Co. of Maryland,, Insurance Exchange, San Francisco.
J. T. Costello Co., 216 Pine St., San Francisco.
Robertson & Hall, First National Bank Bldg., San Francisco.

CONTRACTORS, GENERAL
Arthur Arlett, New Call Bldg., San Francisco.
Farrell & Reed, 183 Jessie St., San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Carnahan & Mulford, 45 Kearny St., San Francisco.
Houghton Construction Co., Flatiron Bldg., San Francisco.
Geo. H. Bos, Hearst Bldg., San Francisco.
Larsen, Sampson & Co., Crocker Bldg., San Francisco.
J. D. Hannah, 725 Chronicle Bldg., San Francisco.
Stockholm & Allyn, Monadnock Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
L. G. Bergren & Son, Call Bldg., San Francisco.
Grace & Bernieri, Claus Spreckels Bldg., San Francisco.
Geo. W. Boxton & Son, Hearst Bldg., San Francisco.
W. C. Duncan & Co., 526 Sharon Bldg., San Francisco.
Harvey A. Klyce, New Call Bldg., San Francisco.
Knowles & Mathewson, Call Bldg., San Francisco.
C. L. Wold Co., 75 Sutter St., San Francisco.
P. R. Ward, 981 Guerrero St., San Francisco.
Lange & Bergstrom, Sharon Bldg., San Francisco.
Alfred H. Vogt, 231 Builders Exchange Bldg., San Francisco.
T. B. Goodwin, 110 Jessie St., San Francisco.
Thos. Elam & Son, Builders Exchange, San Francisco.
Masow & Morrison, 518 Monadnock Bldg., San Francisco.
Lawton & Vezey, 206 Plaza Bldg., Oakland

PHŒNIX SIDEWALK LIGHTS

ARE INSTALLED at the Santa Fe Building, Second and Market Streets, San Francisco

PHŒNIX SIDEWALK LIGHT CO.

472 Monadnock Building, SAN FRANCISCO Telephone Douglas 3111

MAS-OLEUM FLOORING (A Mastic Linoleum)
DUSTLESS, SEAMLESS, WATERPROOF, ACID and ALKALI PROOF
VAN FLEET - FREEAR COMPANY, Agents
Telephone Douglas 1227 120 JESSIE STREET, SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONTRACTORS, GENERAL—Continued
Palmer & Peterson, Monadnock Bldg., San Francisco.
Robert Trost, Twenty-sixth and Howard Sts., San Francisco.
John Monk, Sheldon Bldg., San Francisco.

CONVEYING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CORK TILING, FLOORING, ETC.
Be-ver Cork Tile. Sold by W. L. Eaton & Co., 812 Santa Marina Bldg., San Francisco.
Van Fleet-Freear Company, 120 Jessie St., San Francisco.

CORNER BEAD
Capitol Art Metal Works, Call-Post Bldg., San Francisco.
United States Metal Products Co., 555 Tenth St., San Francisco; 750 Keller St., San Francisco.

CORK TILE AND INSULATION
Van Fleet-Freear Co., 120 Jessie St., San Francisco.

CRUSHED ROCK
Grant Gravel Co., Flatiron Bldg., San Francisco.
California Building Material Company, new Call Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., San Francisco.
Quality Sand & Rock Co., 400 Cunard Bldg., San Francisco.

DAMP-PROOFING COMPOUND
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Biturine Co., 24 California St., San Francisco.
Imperial Co., Monadnock Bldg., San Francisco.
"Pabco" Damp-Proofing Compound, sold by Paraffine Paint Co., 34 First St., San Francisco.
Wadsworth, Howland & Co., Inc., 84 Washington St., Boston. (See Adv. for Coast agencies.)

DOOR HANGERS
McCabe Hanger Mfg. Co., New York, N. Y.
Pitcher Hanger, sold by National Lumber Co., 326 Market St., San Francisco.
Reliance Hanger, sold by Sartorius Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Columbia Wire & Iron Works, Portland, Ore.

DRAIN BOARDS, SINK BACKS, ETC.
Germanwood Floor Co., 1621 Eddy St., San Francisco.

DRINKING FOUNTAINS
Haws Sanitary Fountain, 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.

DRINKING FOUNTAINS—Continued
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 173 Beale St., San Francisco.
M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELECTRICAL CONTRACTORS
Butte Engineering Co., 683 Howard St., San Francisco.
Goold & Johns, 113 S. California St., Stockton, Cal.
NePage, McKenny Co., 149 New Montgomery St., San Francisco.
Newbery Electrical Co., 413 Lick Bldg., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
H. S. Tittle, 245 Minna St., San Francisco.
Standard Electrical Construction Company, 60 Natoma St., San Francisco.

ELECTRICAL ENGINEERS
Chas. T. Phillips, Pacific Bldg., San Francisco.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 126 Beale St., San Francisco.

ENGINEERS
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

FIRE ESCAPES
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE EXTINGUISHERS
Scott Company, 243 Minna St., San Francisco
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

FIREPROOFING AND PARTITIONS
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

FIXTURES—BANK, OFFICE, STORE, ETC.
T. H. Meek & Co., 1130 Mission St., San Francisco.
The Fink & Schindler Co., 218 13th St., San Francisco.
A. J. Forbes & Son, 1530 Filbert St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

D. N. & E. WALTER & CO.
"SINCE 1858"
LINOLEUMS—CARPETS LARGE STOCKS CARRIED
Estimates furnished on request
100 STOCKTON STREET SAN FRANCISCO

"BE-VER" CORK TILING

Artistic = Quiet = Durable
MADE IN A WIDE RANGE OF COLORS — MODERATE IN PRICE.
W. L. EATON & CO., Agents
112 Market St., San Francisco Telephone Garfield 372
See sample installation at The Building Material Exhibit, 77 O'Farrell Street

ARCHITECTS' SPECIFICATION INDEX—*Continued*

FLOOR TILE
New York Belting and Packing Company, 519 Mission St., San Francisco.
W. L. Eaton & Co., 112 Market St., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Berry Bros., 250-256 First St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
R. N. Nason & Co., San Francisco and Los Angeles.

FLOORS—COMPOSITION
"Vitrolite," for any structure, room or bath. Vitrolite Construction Co., 1490 Mission St., San Francisco.
Germanwood Floor Co., 1621 Eddy St., San Francisco.

FLOORS—HARDWOOD
Oak Flooring Bureau, Conway Bldg., Chicago, Ill.
Strable Mfg. Co., 511 First St., Oakland.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.

FURNACES—WARM AIR
Miller-Enwright Co., 907 Front St., Sacramento.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co., 612 Howard St., San Francisco.
Rix Compressed Air and Drill Company, First and Howard Sts., San Francisco.

GARBAGE CHUTES
Bradshaw Sanitary Garbage Chute, Aylsworth Agencies Co., 591 Mission St., San Francisco, sole agents for California.

GAS GRATES
General Gas Light Co., 768 Mission St., San Francisco.

GLASS
W. P. Fuller & Company, all principal Coast cities.
Whittier, Coburn Co., Howard and Beale Sts., San Francisco.

GLASS BRICK
California Glass Brick Co., 228 Grant Ave., San Francisco.

GRADING, WRECKING, ETC.
P. Montague Co., 110 Jessie St., San Francisco.
Dolan Wrecking & Construction Co., 1607 Market St., San Francisco

GRANITE
California Granite Co., Sharon Bldg., San Francisco.
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.

GRAVEL AND SAND
California Building Material Co., new Call Bldg., San Francisco.
Del Monte White Sand, sold by Pacific Improvement Co., Crocker Bldg., San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
Grant Rock & Gravel Co., Cory Bldg., Fresno.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., 704 Market St., San Francisco.
Quality Sand & Rock Co., 400 Cunard Bldg., San Francisco.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.
Empire Plaster sold by Pacific Portland Cement Co., Pacific Bldg., San Francisco.

HARDWARE
Joost Bros., agents for Russell & Erwin hardware, 1053 Market St., San Francisco.
Pacific Hardware & Steel Company, representing Lockwood Hardware Co., San Francisco.
Sargent's Hardware, sold by Bennett Bros., 514 Market St., San Francisco.

HARDWOOD LUMBER—FLOORING, ETC.
Dieckmann Hardwood Co., Beach and Taylor Sts., San Francisco.
Parrott & Co., 320 California St., San Francisco.
White Bros., cor. Fifth and Brannan Sts., San Francisco.
Strable Mfg. Co., 511 First St., Oakland.

HEATERS—AUTOMATIC
Pittsburg Water Heater Co., 478 Sutter St., San Francisco.

HEATING AND VENTILATING
Gilley-Schmid Company, 198 Otis St., San Francisco.
Mangrum & Otter, Inc., 507 Mission St., San Francisco.
Charles T. Phillips, Pacific Bldg., San Francisco.
James & Drucker, 450 Hayes St., San Francisco.
J. C. Hurley Co., 509 Sixth St., San Francisco.
Illinois Engineering Co., 563 Pacific Bldg., San Francisco.
Neil II. Dunn, 786 Ellis St., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
Scott Company, 243 Minna St., San Francisco.

HEAT REGULATION
Johnson Service Company, 149 Fifth St., San Francisco.

HOLLOW BLOCKS
Denison Hollow Interlocking Blocks. Cannon-Phillips Co., Forum Bldg., Sacramento, and the Howard Company, Oakland.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

MADE IN SAN FRANCISCO
PASSENGER and FREIGHT ELEVATORS
INVESTIGATE OUR PRODUCT
SPENCER ELEVATOR COMPANY
126-128 Beale Street, SAN FRANCISCO Phone Kearny 664

McELHINNEY TILE CO.
Contractors for
FLOOR, WALL AND MANTEL TILE
1097 Mission Street, San Francisco — Park 6986

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HOSPITAL EQUIPMENT
Sierra Electric Construction Company, 619 Call Bldg., San Francisco.

HOSPITAL FIXTURES
J. L. Mott Iron Works, 135 Kearny St., San Francisco.

HOTELS
St. Francis Hotel, Union Square, San Francisco
Hotel Whitcomb, facing Civic Center, San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and Monadnock Bldg., San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INSURANCE
J. T. Costello Co., 216 Pine St., San Francisco.

INTERIOR DECORATORS
Albert S. Bigley, 344 Geary St., San Francisco.
City of Paris, Geary and Stockton Sts., San Francisco.
A. Falvy, 578 Sutter St., San Francisco.
The Tormey Co., 1042 Larkin St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
O'Hara & Livermore, Sutter St., San Francisco.

LANDSCAPE ARCHITECTS
Neil T. Childs Co., 68 Post St., San Francisco.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 135 Kearny St., San Francisco.
Ralston Iron Works, 20th and Indiana Sts., San Francisco.

LANDSCAPE GARDENERS
MacRorie-McLaren Co., 141 Powell St., San Francisco.

LATHING MATERIAL
"Buttonlath," manufactured by Buttonlath Mfg. Co., office, Building Material Exhibit, San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co., 445 Sutter St., San Francisco.
The Fish Fuel System, 50 Eighth St., San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
D. N. & E. Walter & Co., O'Farrell and Stockton Sts., San Francisco.

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.

LUMBER—Continued
Hooper Lumber Co., Seventeenth and Illinois Sts., San Francisco.
Portland Lumber Co., 16 California St., San Francisco.
Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
Pope & Talbot, foot of Third St., San Francisco.
Sunset Lumber Co., Oakland, Cal.
United Lumber Company, 687 Market St., San Francisco.
California Redwood Association, 723 Call-Post Bldg., San Francisco.

MAIL CHUTES
Cutler Mail Chute Co., Rochester, N. Y. (See adv. on page 30 for Coast representatives.)
American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., Monadnock Bldg. Arcade., San Francisco.

MANTELS
Mangrum & Otter, 561 Mission St., San Francisco.

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.

METAL CEILINGS
San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

METAL DOORS AND WINDOWS
U. S. Metal Products Co., 555 Tenth St., San Francisco.
Capitol Art Metal Works, New Call Bldg., San Francisco. Factory in Richmond.

METAL FURNITURE
Capitol Art Metal Works, New Call Bldg., San Francisco. Factory in Richmond.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.

MILL WORK
Dudfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218 13th St., San Francisco.

OIL BURNERS
American Standard Oil Burner Company, Seventh and Cedar Sts., Oakland.
S. T. Johnson Co., 1337 Mission St., San Francisco.
T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., San Francisco.
Fess System, 220 Natoma St., San Francisco.
W. S. Ray Mfg. Co., 218 Market St., San Francisco.

NASON'S OPAQUE FLAT FINISH A FLAT, WASHABLE OIL PAINT, made in soft Kalsomine tints—a practical article for WALLS, CEILINGS, Etc. Economical and Durable. Agency TAMM & NOLAN COMPANY'S high grade Varnishes and Finishes, made on the Pacific Coast to stand our climatic conditions.
R. N. NASON & CO., Paint Makers
151 Potrero Ave.—SAN FRANCISCO—54 Pine Street
PORTLAND
SEATTLE
LOS ANGELES

CLARENCE E. MUSTO. Pres. JOSEPH B. KEENAN. Vice-Pres. GUIDO J. MUSTO. Sec'y & Treas.

JOSEPH MUSTO SONS-KEENAN CO.

Phone Franklin —6365— MARBLE OFFICE AND MILLS: 535-565 North Point St., SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE
- American Art Metal Works, 13 Grace St., San Francisco.
- California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
- Fair Manufacturing Company, 617 Bryant St., San Francisco.
- Palm Iron & Bridge Works, Sacramento.
- Ralston Iron Works, 20th and Indiana Sts., San Francisco.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
- Schreiber & Sons Co., represented by Western Builders Supply Co., San Francisco.
- Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
- West Coast Wire & Iron Works, 861-863 Howard St., San Francisco.

PAINT FOR CEMENT
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.) (See adv. in this issue for Pacific Coast agents.)
- Fuller's Concreta for Cement, made by W. P. Fuller & Co., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
- Berry Bros., 250-256 First St., San Francisco.
- Biturine Company, 24 California St., San Francisco.
- Pacific Coast Paint Corp'n, Security Bank Bldg., Oakland.
- Paraffine Paint Co., 34 First St., San Francisco.
- Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.

PAINTING, TINTING, ETC.
- Golden Gate Decorating Co., 704 Polk St., San Francisco.
- I. R. Kissel, 1747 Sacramento St., San Francisco.
- D. Zelinsky & Sons, San Francisco and Los Angeles.
- The Tormey Co., 681 Geary St., San Francisco.
- Fick Bros., 475 Haight St., San Francisco.

PAINTS, OILS, ETC.
- The Brininstool Co., Los Angeles, the Haslett Warehouse, 310 California St., San Francisco.
- Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco.
- Berry Bros., 250-256 First St., San Francisco.
- Biturine Co., 24 California St., San Francisco
- Pacific Coast Paint Corp'n, Security Bank Bldg., Oakland.
- Magner Bros., 419-421 Jackson St., San Francisco.
- R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
- W. P. Fuller & Co., all principal Coast cities.
- Standard Varnish Works, 55 Stevenson St., San Francisco.

PANELS AND VENEER
- White Bros., Fifth and Brannan Sts., San Francisco.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA
- Gladding, McBean & Co., Crocker Bldg., San Francisco.

PLASTER CONTRACTORS
- C. C. Morehouse, Crocker Bldg., San Francisco.
- MacGruer & Co., 180 Jessie St., San Francisco.

PLASTER EXTERIORS
- Buttonlath, for exterior and interior plastering, Hearst Bldg., San Francisco.

PLUMBING CONTRACTORS
- Alex Coleman, 706 Ellis St., San Francisco.
- A. Lettich, 365 Fell St., San Francisco.
- Neil H. Dunn, 786 Ellis St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Scott Co., Inc., 243 Minna St., San Francisco.
- Wm. F. Wilson Co., 328 Mason St., San Francisco.

PLUMBING FIXTURES, MATERIALS, ETC.
- Crane Co., San Francisco and Oakland.
- California Steam Plumbing Supply Co., 671 Fifth St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Glauber Brass Manufacturing Company, 1107 Mission St., San Francisco.
- Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
- Improved Sanitary Fixture Co., 632 Metropolitan Bldg., Los Angeles.
- J. L. Mott Iron Works, D. H. Gulick, selling agent, 135 Kearny St., San Francisco.
- Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
- H. Mueller Manufacturing Co., Pacific Coast branch, 589 Mission St., San Francisco.
- Miller-Enwright Co., 907 Front St., Sacramento.
- Mark-Lally Co., 235 Second St., San Francisco, also Oakland, Fresno, San Jose and Stockton.
- Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
- Standard Sanitary Mfg. Co., 149 Bluxome St., San Francisco.
- Wm. F. Wilson Co., 328 Mason St., San Francisco.
- Neil H. Dunn, 786 Ellis St., San Francisco.

POTTERY
- Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

POWER TRANSMITTING MACHINERY
- Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PUMPS
- Simonds Machinery Co., 117 New Montgomery St., San Francisco.

RAILROADS
- Southern Pacific Company, Flood Bldg., San Francisco.
- Western Pacific Company, Mills Bldg., San Francisco.

REFRIGERATORS
- McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton Sts., San Francisco.

BRADSHAW
SANITARY GARBAGE CHUTE
For full particulars see
AYLSWORTH AGENCIES CO.
591 Mission St. San Francisco Tel., Douglas 4405

Jackson's Patent Sidewalk Lights and "No Leak" Sidewalk Doors
FIRST AND BEST
P. H. Jackson & Co. 237 - 247 FIRST ST., SAN FRANCISCO
Tel. Kearny 1959

ARCHITECTS' SPECIFICATION INDEX—*Continued*

REVERSIBLE WINDOWS
Hauser Reversible Window Company, Balboa Bldg., San Francisco.
Whitney Windows, represented by Richard Spencer, 801-3 Hearst Bldg., San Francisco.

REVOLVING DOORS
Van Kennel Doors, sold by U. S. Metal Products Co., 525 Market St., San Francisco.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
C. F. Weber & Co., 365 Market St., S. F.
Kinnear Steel Rolling Door Co., Waterhouse-Wilcox Co., Monadnock Bldg. Arcade, San Francisco.
Wilson's Steel Rolling Doors, U. S. Metal Products Co., San Francisco and Los Angeles.

ROOFING AND ROOFING MATERIALS
Asbestos Protected Metal Company, Hobart Building, San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
H. W. Johns-Manville Co., Second and Howard Sts., San Francisco.
Niles Sand, Gravel and Rock Co., Mutual Bank Bldg., San Francisco.
"Malthoid" and "Ruberoid," manufactured by Paraffine Paint Co., San Francisco.
Pioneer Roofing, manufactured by Pioneer Paper Co., 513 Hearst Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.
Vulcanite Products—Vulcanite ornamental roofings and Vulcanite roofing shingles, sold by Patent Vulcanite Roofing Co., 16th and Texas Sts., San Francisco.

RUBBER TILING
New York Belting & Rubber Company, 519 Mission St., San Francisco.

SAFETY TREADS
"Sanitread," sold by Richard Spencer, 801-3 Hearst Bldg., San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.
C. Jorgensen, Crossley Bldg., San Francisco.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co., 365 Market St., San Francisco; 512 S. Broadway, Los Angeles.
Rucker-Fuller Desk Company, 677 Mission St., San Francisco.

SCREENS
Hipolito Flyout Screens, sold by Simpson & Stewart, Dalziel Bldg., Oakland.
Watson Metal Frame Screens, sold by Richard Spencer, 801-3 Hearst Bldg., San Francisco.

SEEDS
California Seed Company, 151 Market St., San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Paraffine Paint Co., 34 First St., San Francisco.

SHEET METAL WORK, SKYLIGHTS, ETC.
Asbestos Protected Metal Company, Hobart Bldg., San Francisco.
Capitol Sheet Metal Works, New Call Bldg., San Francisco. Works in Richmond.
U. S. Metal Products Co., 555 Tenth St., San Francisco.

SHINGLE STAINS
Cabot's Creosote Stains, sold by Pacific Building Materials Co., Underwood Bldg., San Francisco
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SIDEWALK LIGHTS
P. H. Jackson & Co., 237-47 First St., San Francisco.
Jas. P. Dwan, Hearst Bldg., San Francisco.
Phoenix Sidewalk Light Co., 472 Monadnock Bldg., San Francisco.

STEEL TANKS, PIPE, ETC.
Schaw-Batcher Co. Pipe Works, 356 Market St., San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Dyer Bros., 17th and Kansas Sts., San Francisco.
Golden Gate Iron Works, 1541 Howard St., San Francisco.
Judson Manufacturing Co., 819 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Southern California Iron and Steel Co., Fourth and Mateo Sts., Los Angeles.
Western Iron Works, 141 Beale St., San Francisco.

STEEL PRESERVATIVES
Bay State Steel Protective Coating, manufactured by Wadsworth, Howland Co. (See adv. for coast agencies.)
Paraffine Paint Co., 34 First St., San Francisco.
Biturine Company, 24 California St., San Francisco.

STEEL REINFORCING
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Southern California Iron & Steel Company, Fourth and Mateo Sts., Los Angeles; W. B. Kyle, San Francisco representative, Call Bldg.
Woods, Huddart & Gunn, 444 Market St., San Francisco.

STEEL ROLLING DOORS
Kinnear Steel Rolling Door Co., Rialto Bldg., San Francisco.

STEEL SASH
"Fenestra," solid steel sash, manufactured by Detroit Steel Products Company, Detroit, Mich.

REGISTERED PREPARED VULCANITE ROOFINGS TRADE MARK
VULCANITE ROOFINGS
including
ROLLS, SHINGLES and ORNAMENTAL EFFECTS
PATENT VULCANITE ROOFING COMPANY
San Francisco Depot, 16th and Texas Sts. Phone Market 390

LATH, SHINGLES, SHAKES and POSTS, SASH, DOORS and MILL WORK
TIMBERS and SPECIALS KILN DRIED FINISH and FLOORING

SUNSET LUMBER COMPANY
DEALERS WHOLESALE AND RETAIL IN
PINE and REDWOOD LUMBER

PHONE OAKLAND 1820
YARDS AND OFFICE
OAK AND FIRST STS., OAKLAND, CAL.

PORTLAND LUMBER CO.

Yards { TRACY, CAL. BRENTWOOD, CAL.
Phone KEARNY 2074

PORTLAND LUMBER COMPANY
A. J. RUSSELL, Agent
LUMBER
SIMPLEX SILOS
SAGINAW SPECIAL SHINGLES
Ship Timbers, Oil Rigs and Special Bills Cut to Order.
16 California Street San Francisco, Cal.

Millwork Manufactured
and Delivered Anywhere
Plans or Lists sent us for Estimates will have Careful and Immediate Attention
DUDFIELD LUMBER CO.
Main Office, Yard and Planing Mill - PALO ALTO
JNO. DUDFIELD, President and Manager JOSEPH A. JURY, Secretary and Mill Supt

Phone Kearny 2080
UNITED LUMBER MILLS
Pine and Redwood Lumber
WHOLESALE AND RETAIL—ESTIMATES GIVEN
687 MARKET STREET SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

STEEL WHEELBARROWS
Champion and California steel brands, made by Western Iron Works, 141 Beale St., San Francisco.

STONE
California Granite Co., 518 Sharon Bldg., San Francisco.
McGilvray Stone Company, 634 Townsend St., San Francisco.

STORAGE SYSTEMS—GASOLINE, OIL, ETC.
S. F. Bowser & Co., 612 Howard St., San Francisco.
Rix Compressed Air and Drill Co., First and Howard Sts., San Francisco.

TELEPHONE AND ELECTRIC EQUIPMENT
Aylsworth Agencies Company, 591 Mission St., San Francisco.

TELEPHONE SIGNALS
Sierra Electric Construction Co., Call-Post Bldg., San Francisco.

TEMPERATURE REGULATION
Johnson Service Company, 149 Fifth St., San Francisco.

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market St., San Francisco.

TILES, MOSAICS, MANTELS, ETC.
Rigney Tile Company, Sheldon Bldg., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.
McElhinney Tile Co., 1097 Mission St., San Francisco.

TILE FOR ROOFING
Gladding, McBean & Co., Crocker Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

TILE WALLS—INTERLOCKING
Denison Hollow Interlocking Blocks, Forum Bldg., Sacramento.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

VACUUM CLEANERS
Palm Vacuum Cleaners, sold by Western Vacuum Supply Co., 1125 Market St., San Francisco.
Spencer Turbine Cleaner, sold by Hughson & Merton, 530 Golden Gate Ave., San Francisco.

VALVES
Sloan Royal Flush Valves. T. R. Burke, Pacific Coast agent, Wells Fargo Bldg., San Francisco.
Crane Radiator Valves., manufactured by Crane Co., Second and Brannan Sts., San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
Berry Bros., 250-256 First St., San Francisco.
W. P. Fuller Co., all principal Coast cities.
Pacific Coast Paint Corp'n, 112 Market St., San Francisco; Security Bank Bldg., Oakland.
R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
Standard Varnish Works, San Francisco.
S. F. Pioneer Varnish Works, 816 Mission St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
Burlington Venetian Blinds, Burlington, Vt., and C. F. Weber & Co., 365 Market St., San Francisco.
Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.

WALL BEDS, SEATS, ETC.
Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.
Perfection Disappearing Bed Co., 739 Mission St., San Francisco.

WALL BOARD
"Amiwud" Wall Board, manufactured by Paraffine Paint Co., 34 First St., San Francisco.

WALL PAINT
Nason's Opaque Flat Finish, manufactured by R. N. Nason & Co., San Francisco, Portland and Los Angeles.
San-A-Cote and Vel-va-Cote, manufactured by the Brininstool Co., Los Angeles.

WALL PAPER
Uhl Bros., 38 O'Farrell St., San Francisco.
The Tormey Co., 681 Geary St., San Francisco.

WATER HEATERS—AUTOMATIC
Pittsburg Water Heater Co. of California, 478 Sutter St., San Francisco, and 402 Fifteenth St., Oakland.

WATERPROOFING FOR CONCRETE, BRICK, ETC.
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Biturine Company, 24 California St., San Francisco.
Goffette Sales Corporation, Monadnock Bldg., San Francisco.
H. W. Johns-Manville Co., San Francisco and principal Coast cities.
Imperial Co., 183 Stevenson St., San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Wadsworth, Howland & Co., Inc. (See adv. for Coast agencies.)

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL FINISH
"Gold Seal," manufactured and sold by Bass-Hueter Paint Company. All principal Coast cities.
"Silkenwhite," made by W. P. Fuller & Co., San Francisco.
"Satinette," Standard Varnish Works, 113 Front St., San Francisco.

WINDOWS—REVERSIBLE, CASEMENT, ETC.
Atkinson Safety Window at Building Material Exhibit, 77 O'Farrell street, San Francisco.
Whitney Window, represented by Richard Spencer, Hearst Bldg., San Francisco.
Hauser Reversible Window Co., Balboa Bldg., San Francisco.

WIRE FABRIC
U. S. Steel Products Co., Rialto Bldg., San Francisco.

WOOD MANTELS
Fink & Schindler, 218 13th St., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.

Now is the Time to lay out your Country
Place with the best the market affords in

TREES ∴ SEEDS ∴ BULBS

CALIFORNIA SEED COMPANY

AL. J. NEVRAUMONT, Manager
Phone Douglas 5895

151 Market Street, San Francisco

Fan Shell Beach Sand

AND

Del Monte White Sand

A Wonderful Combination for a Perfect Stucco Finish. Try it.

Pacific Improvement Company

CROCKER BLDG.

San Francisco

Phone Sutter 6130

Pitcher Door Hangers

HUMPHREY APARTMENTS, SAN FRANCISCO
C. A. MEUSSDORFFER, Architect
Equipped with PITCHER HANGERS.

Give Service Satisfaction

Are Dependable Durable and Economical

No extra thickness of wall required. Installed in $5\frac{1}{2}$ inch partitions. Specify sliding doors in place of swinging doors.

Manufactured by

National Mill and Lumber Company

Kearny 3580

326 Market Street
SAN FRANCISCO

MOTT PLUMBING FIXTURES

Architects and their clients are invited to visit our Showrooms, 135 Kearny St., San Francisco; D. H. GULICK, Sales Agent. Los Angeles Office, 1001 Central Building; J. R. MAYHEW, Sales Agent. Portland, Ore., Office, Sherlock Bldg.; F. J. KANE, Sales Agent. Seattle, Wash., Office, Securities Bldg.; P. C. WAACK, Sales Agent.

THE J. L. MOTT IRON WORKS
Established 1828

CALIFORNIA STEAM AND PLUMBING SUPPLY CO.

PIPE, VALVES AND FITTINGS
FOR
STEAM, GAS, WATER AND OIL

COMPLETE STOCK OF
The Kelly & Jones Company Products
WRITE FOR CATALOGUE

OFFICE AND WAREHOUSE:
671-679 FIFTH STREET
Corner Bluxome
SAN FRANCISCO, CALIFORNIA

Telephone Sutter 737

Architects and Building Contractors

THE BINDING OF YOUR MAGAZINES
and PERIODICALS IS OUR SPECIALTY

Expert Plate and Map Mounting

THE HICKS-JUDD COMPANY
BOOKBINDERS

51-65 FIRST STREET SAN FRANCISCO, CAL.

SPECIFY GLAUBER FAUCETS

not only because they are GUARANTEED FIVE YEARS, but because of the QUALITY which enables us to guarantee them.

The Jury of Awards at the P. P. I. E. gave us **Seven Medals**, not because we indemnify our users against trouble with our goods, but because **Glauber Quality Faucets** don't cause trouble.

Three hundred of the best buildings on the Pacific Coast are equipped with **Glauber Cocks.**

Send for illustrated specification book.

Main Office and Factory
CLEVELAND, O.

Glauber Brass Mfg. Co.
567 Mission Street, San Francisco, Cal.

Eastern Branch
130 W. 32nd St.
NEW YORK

CALIFORNIA VITRIFIED BRICK

stands alone in its class among our Home Industries and is the best Paving Block made anywhere.

It is used on the streets of SAN FRANCISCO, OAKLAND, SAN JOSE, BERKELEY, SAUSALITO, LIVERMORE, SARATOGA, CALISTOGA and other California Cities.

Its use Insures Satisfactory and Permanent Pavements

INVESTIGATE NOW SAMPLES FURNISHED

California Brick Company

NILES, CALIFORNIA

Representatives at San Francisco and Oakland Exchanges

LIVERMORE PRESSED, MATT GLAZED AND ENAMELED BRICK

in a variety of colors including "Mottles," "Ruff," White, Ivory White, Cream, Grey, Green, Brown, Blue, etc., are designed to meet the requirements of Architects desiring permanent and unique effects.

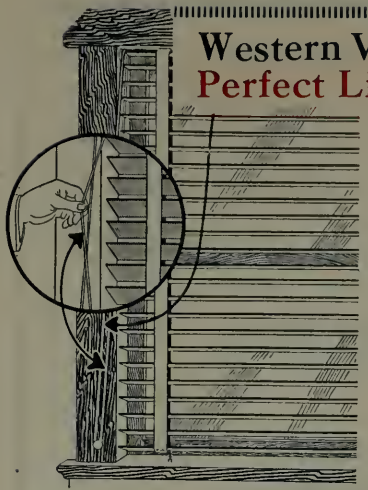
Full size sample sent on request.

LARGE PRODUCTION—ATTRACTIVE PRICES—PROMPT DELIVERIES

Livermore Fire Brick Works

LIVERMORE, CALIFORNIA

Representatives at San Francisco and Oakland Exchanges



Western Venetian Blinds *assure* Perfect Light and Ventilation

THE SLATS can be adjusted to Any Angle, supplying Light of the Exact Intensity Required. Easy to operate and will last as long as the building.

For Office Buildings, Municipal Buildings, Schools, Churches and Residences.

WESTERN BLIND & SCREEN CO.
2700 Long Beach Avenue
Los Angeles, - California

C. F. WEBER & CO., Agents
San Francisco Los Angeles Reno, Nev. Phœnix, Ariz.

Every Architect

and engineer who is interested in school construction will be interested in our new folder—"Buttonlath in Schools."

It proves conclusively the wonderful superiority of Buttonlath for use in public buildings; contains halftones of 17 new schools. Will be sent you free on request.

SOUND-PROOF WALLS

are a necessity in schools, where echoing and transmission of noises might easily disrupt the proper conduct of classes. Buttonlath has wonderful sound deadening qualities; is remarkably fire resistant; is allowed wherever metal lath is allowed.

MANUFACTURED BY

BUTTONLATH MANUFACTURING CO.

Boyle and Vernon Avenues
LOS ANGELES, CAL.

77 O'Farrell Street
SAN FRANCISCO, CAL

FOR THE ARCHITECT

Who specifies a "PITTSBURG" Automatic Gas Water Heater — he is confident that his judgment will be commended.

FOR THE CUSTOMER

Who purchases a "PITTSBURG" Automatic Gas Water Heater — he is assured beyond a doubt of many years of satisfactory Hot Water Service.

PITTSBURG WATER HEATER COMPANY of California
478 Sutter St., San Francisco 402 15th St., Oakland

A Big Thing

New Model No. 65 "Pittsburg-Bungalow" Automatic Water Heater, Capacity three gallons per minute.

VITROLITE "BETTER THAN MARBLE"

VITROLITE

"Better Than Marble"

City Hall, San Francisco
Bakewell & Brown, Architects

IDEAL FOR TOILETS

For toilet partitions and wainscoting in toilet and bathrooms Vitrolite is unsurpassed. It is snow white, sustainable and impervious to the action of acids. Its brilliantly polished surface can be sterilized without injury. Our new toilet construction is the acme of sanitation and durability. We will gladly send details.

THE VITROLITE CONSTRUCTION COMPANY

1490 Mission Street San Francisco, California

QUALITY PAINT PRODUCTS
Brininstool

San-a-Cote (GLOSS)

(CAN BE SCRUBBED)

AN INTERIOR WALL FINISH

For bath rooms, kitchens, hospitals, schools, office and public buildings. Ask dealers, owners, architects and contractors about this durable, sanitary, washable, economical wall covering.

Brininstool makes a paint for every purpose, and every can purposely good

THE BRININSTOOL CO., LOS ANGELES

COLOR GRINDERS AND PAINT MANUFACTURERS

Distributors—The Brininstool Co., care of Haslett Warehouse Co., 310 California St., San Francisco; Schutz Paint Co., Fresno, Cal.; Schneider, Chappell & Jones, Sacramento, Cal.; Salt Lake Glass & Paint Co., Salt Lake City, Utah; Griffin Paint Co., Ogden, Utah; Ernest Miller Wall Paper Co., 172 First St., Portland, Ore.; Hickox-Crampton Paint Co., Tacoma, Wash.; Campbell Hardware Co., First and Madison Sts., Seattle, Wash.; Imperial Valley Hardware Co., El Centro, Calexico, Imperial, Brawley, Seeley; Spokane Hardware Co., Spokane, Wash.; Ellis Paint Co., Butte, Mont.; Simons Paint and Paper Co., Missoula, Cal.

Comfort

we know is a first essential in the designing and building of beds. You can install our Oscillating Portal Wall Beds and be assured that they will give tenants absolute comfort and satisfaction. Eleven years of experience have taught us what springs to use, how to hang them and all the other little points that make for comfortable sleeping.

Our Wall Beds are as comfortable as the best bed you have ever slept in.

MARSHALL & STEARNS CO.

WALL BEDS

1152 PHELAN BUILDING — SAN FRANCISCO
1774 BROADWAY — OAKLAND

GEO. H. DYER, President — R. W. DYER, Vice-Pres. — W. J. DYER, Sec'y

DYER BROTHERS

Golden West Iron Works, Inc.

Structural Iron and Steel Contractors

ORNAMENTAL IRON WORK

Office and works:
17th and KANSAS STREETS

SAN FRANCISCO, CAL.
Phone Market 134

Cast Iron Entrance and Bronze Doors.
Lincoln High School, Portland, Oregon

EXECUTED BY

SARTORIUS COMPANY, Inc.
ORNAMENTAL IRON AND BRONZE
15th and Utah Sts., San Francisco

Johns-Manville Akoustolith
An Acoustical Stone for Interior Facing

We are now able to offer architects an artificial stone—Johns-Manville Akoustolith—for use as an interior facing for acoustical purposes. Comparable in sound-absorbing power with the old corrective agencies, it removes limitations of design and finish and opens up a new field of wide possibilities.

Johns-Manville Akoustolith is a porous, fireproof, masonry material cast in blocks, tile or brick, for ashlar or vaulted surfaces. It can also be moulded in ornamental form. It possesses marked beauty of surface texture, and is light in weight. Supplied in a variety of stone colors.

H. W. JOHNS-MANVILLE CO.
of California
2nd & Howard Sts., San Francisco
Los Angeles Sacramento San Diego

Stationary Outfit

To ARCHITECTS and ENGINEERS

The Public is tired of buying Gasoline by hidden measurement—All up-to-date equipments demand the VISIBLE Method of Supply.

DELANOY VISIBLE SYSTEM

Any station equipped with the visible apparatus will sell from 25 to 50 per cent more gasoline than by the ordinary method. Send for Circulars.

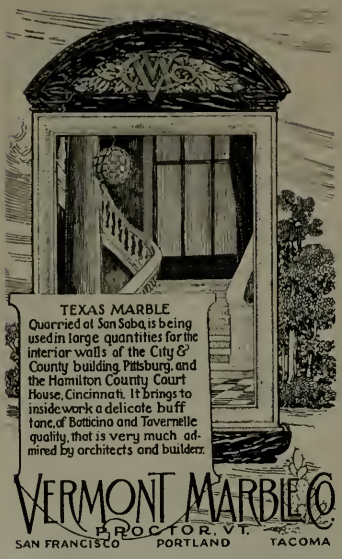
RIX COMPRESSED AIR & DRILL CO.
Sole Manufacturers
San Francisco Los Angeles

"THE BOUDOIR" (Reg. Trade Mark)
Pat. Dec. 1913, Jan. 1915

Examine any bathroom, or any plan of a bathroom, with three separate fixtures set in any of the customary ways.
Cut out the separate lavatory, all its fittings, supply and waste pipes, trap, vent and connections. Sum up the cost of these; then
Substitute "THE BOUDOIR" Bath Fixture, with its large 20x24-inch pedestal lavatory, accessibly placed, taking no space usable for any other purpose.
Notice the improved appearance, additional room, the gained conveniences of a sitting shower, shampoo, washing in fresh running water, support in getting in and out of the bath tub, fewer fittings to polish and keep in order.

Prompt deliveries anywhere from our nearest Factory.

IMPROVED SANITARY FIXTURE COMPANY, 632 Metropolitan Bldg., Los Angeles, California, - U. S. A.


TEXAS MARBLE
Quarried at San Saba, is being used in large quantities for the interior walls of the City & County building Pittsburg, and the Hamilton County Court House, Cincinnati. It brings to inside work a delicate buff tone, of Botticino and Tavernelle quality, that is very much admired by architects and builders.
VERMONT MARBLE CO.
PROCTOR, VT.
SAN FRANCISCO
PORTLAND
TACOMA

For That Empty Fireplace

The Humphrey Radiantfire

All the charm of an open fire
No odor — No ashes
A Gas Heater that heats.

GENERAL GAS LIGHT CO.

C. B. BABCOCK, Mgr.

768 Mission St. San Francisco

House of Mrs. D. T. Murphy, Hillsborough, Cal.

LAWN AND GARDEN ORNAMENTS

Garden Furniture,
Flower Pots, Vases

Made by

G. Rognier & Co.

233 Railroad Ave., San Mateo, Cal

HOTEL WHITCOMB

AT THE

CIVIC CENTER

OF

SAN FRANCISCO

¶ Free Garage for Guests.

¶ Dinner in the Arabesque Room, one dollar.

¶ Dancing in the Sun Lounge every Evening except Sunday.

¶ Room with bath, one-fifty and up.

¶ American and European.

J. H. VAN HORNE, Manager

Beautiful Oak Floors

EVERYWHERE—WHY?

BECAUSE—

—Oak Flooring, by right of superior merit and conquest, is "America's Best Flooring."

—Women prefer Oak Flooring for the reason it is rich and cheerful in color, and offers unlimited possibilities to give the home that coveted touch of elegance.

—Oak Flooring is Distinctive, Beautiful and Substantial, three very vital reasons why so much Oak Flooring is in use today.

—Owners always demand Oak Flooring as they consider it a good investment. It attracts and satisfies buyers or tenants.

—Of all the hardwood flooring in use today American Oak stands pre-eminent for color, texture and durability.

—Keeps the "For Rent" and "For Sale" signs off the property. Landlords know what is best in flooring.

—Solving the floor problem is possible by OAK FLOORING.

—Increases the selling and renting value of any building, and attracts a better class of buyers, or tenants.

See our page 379—1917 Sweet's Catalogue.

Write for booklets—"America's Best Flooring."

Oak Flooring Service Bureau

1603 UNION TRUST BLDG., CINCINNATI, OHIO

SLOAN VALVE COMPANY'S ROYAL FLUSH VALVES

Combine correct mechanical design and highest efficiency with ease of operation, extreme simplicity and remarkable durability.

Are furnished in a variety of styles, adaptable to a wide range of method of application and working conditions.

Moderate in cost to install—maintenance expense negligible. The ideal equipment for industrial, office, hotel and apartment buildings; schools, jails, comfort stations, etc.

You eliminate risk when you specify the Royal Flush Valve—its reputation is country-wide.

SLOAN VALVE COMPANY

Chicago, Ill.

or 624 Wells Fargo Building, San Francisco

LOOK BEFORE YOU BUILD

When You Build a $1,000 Cottage

you are making an investment every bit as important to YOU as a $1,000,000 skyscraper would be to ITS owner. You ought to be just as certain that you are getting the best materials at the best possible price. And you can be—without any trouble, can select the right material for every purpose from the sidewalk to the shingle-roof—at the

Building Material Exhibit

Many intensely interesting displays of building materials and equipment. If you cannot come, write and let us aid in solving your building problems. Send us your plans and we will secure complete estimates for you without any charge or obligation.

Building Material Exhibit

77 O'Farrell Street, San Francisco

Phone SUTTER 5333 **"LOOK BEFORE YOU BUILD"**

HOTEL ST. FRANCIS

SAN FRANCISCO

Most Beautifully Decorated Public Rooms in the World
European Plan from $2.00

Management :: :: :: JAMES WOODS

STEEL BARS FOR CONCRETE REINFORCEMENT

TWISTED SQUARES, PLAIN SQUARES AND ROUNDS

We Will Make Lump Sum Bids on Reinforcement Fabricated and Installed.

PIG IRON, COKE AND FERRO ALLOYS

WOODS, HUDDART & GUNN

444 MARKET STREET Tel. Sutter 2720 SAN FRANCISCO, CAL.

STEEL OPEN HEARTH BARS FOR CONCRETE REINFORCEMENT

Square Corrugated and Cold Twisted, Plain Rounds and Squares

-----MERCHANT STEEL-----

Flats, Angles, Channels, Rounds, Squares, Rivet & Bolt Steel, Structural Shapes

PACIFIC COAST STEEL COMPANY

PHONE SUTTER 1564

General Office, Rialto Bldg., San Francisco
Sales Office, " " "
Sales Office, Union Oil Building, Los Angeles
Sales Office, Seattle, Wash.

ROLLING MILLS:
South San Francisco
Seattle, Wash. Portland, Ore.

"Havemeyer" Deformed STEEL BARS

FOR REINFORCED CONCRETE CONSTRUCTION

Southern California Iron & Steel Co.

FOURTH AND MATEO STREETS
LOS ANGELES, CAL.

W. B. KYLE, New Call Building,
San Francisco Representative.

THE RAY OIL BURNING SYSTEM—1917 MODEL

Improvements: Enclosed motors, dust, oil and water proof; oil-cooled motor runs 75 per cent cooler; oil heated electrically. Only one place to lubricate for entire machine, and many more exclusive features. Send for catalogue.

W. S. RAY MFG. CO.

Salesroom, 218-220 Market St., SAN FRANCISCO
Phone Kearny 199

Works, Bosworth, Milton & Rousseau, S. P. R. R., San Francisco. Phone Mission 8022

BUILDING FOR THE AMERICAN AUTO PAINTING COMPANY, SAN FRANCISCO
WILLIS POLK & CO., Architects

This Modern Garage, located at Eddy Street and Van Ness Avenue, San Francisco, has been Waterproofed with

MAUERENE LIKWID SEMENT

This preparation does away with the necessity of plastering the Exterior of a Concrete Building, thus very materially reducing the Cost. Likwid Sement gives you a non-checking non-scaling, non-staining, waterproof job. Any color — any texture.

THE IMPERIAL COMPANY

717-719 Monadnock Building, SAN FRANCISCO

Phone SUTTER 1341

Boyle Heights Branch Library, Los Angeles
W. H. Dodd, Architect

Covered with No. 1

MISSION CLAY ROOFING TILE

MANUFACTURED BY
LOS ANGELES PRESSED BRICK CO.
FROST BUILDING, LOS ANGELES

UNITED MATERIALS COMPANY
CROSSLEY BUILDING, SAN FRANCISCO
Distributors for Northern California

The GOLD MEDAL MAIL CHUTE

INSTALLED IN THE NEW SAN FRANCISCO CITY HALL
AND THE WHITE MARBLE MERRITT BUILDING, LOS ANGELES

Given highest award at Panama-Pacific International Exposition, 1915.

Waterhouse-Wilcox Co.
California Representatives

8 Monadnock Bldg. (Arcade)
SAN FRANCISCO

331 E. 4th Street
LOS ANGELES

F. T. CROWE & CO.
Seattle
Agents for Washington.

American Mailing Device Corporation

The Cutler Mail Chute

Mail Box—L. C. Smith Building Seattle, Wash., Gaggin & Gaggin, Architects, Syracuse, N. Y.

Pacific Coast Representatives:

San Francisco, Cal., THOMAS DAY COMPANY.

Portland, Ore. C. W. BOOST.

Seattle and Tacoma, Wash., D. E. FRYER & Co.

Spokane, Wash. E. C. TOUSLEY.

Cutler Mail Chute Co.,
ROCHESTER, N. Y.
Cutler Building.

BIGLEY'S

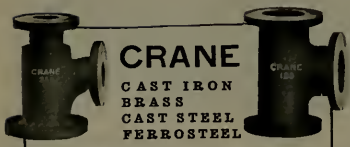
Curtains
Decorated Lamps
and Pottery
Fine Upholstered
and Period
Furniture

498 GEARY STREET
San Francisco, Cal.
Telephone: Franklin 5919

THE·L·SCHREIBER & SONS Co

ORNAMENTAL IRON & BRONZE
STRVCTVRAL STEEL
CINCINNATI

SAN FRANCISCO
WESTERN BVILDERS SVPPLY CO
155 NEW MONTGOMERY ST.
LOS ANGELES
SWEETSER & BALDWIN SAFE CO
200 EAST 9TH ST



CRANE

CAST IRON
BRASS
CAST STEEL
FERROSTEEL

FLANGED FITTINGS

We have the largest line of patterns for flanged fittings for low pressure, standard, extra heavy, hydraulic, superheated and extreme hydraulic pressures, ranging in size from one-inch to sixty-inch, and for working pressures from fifty pounds to three thousand pounds.

The dimensions of the low pressure, standard and extra heavy fittings are in accordance with the 1915 *American Standard*.

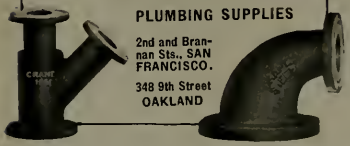
Castings for special fittings also may be made at a minimum expense owing to our large equipment of special patterns which may be altered at very low cost.

CRANE CO.

PLUMBING SUPPLIES

2nd and Brannan Sts., SAN FRANCISCO.

348 9th Street OAKLAND



H. E. BOTHIN, PRESIDENT
W. H. FRENCH, VICE-PRES AND GEN MANAGER
R. B. GIRDWOOD, SECRETARY

JUDSON MANUFACTURING CO.

MANUFACTURERS OF
OPEN HEARTH STEEL
INGOTS, BARS, PLATES AND SMALL SHAPES

STRUCTURAL AND BRIDGE WORK
FOUNDRY, MACHINE AND PATTERN WORK
SHAFTING, BOLTS, SPIKES ETC.

MAIN OFFICE AND SALESROOM
819-823 FOLSOM STREET

OPEN HEARTH STEEL BARS

STRUCTURAL STEEL

Machine Work—Bolts—Castings
Pattern and Blacksmith Work

FERALUN
SAFETY TREADS

UNDERWRITERS' LABORATORIES, INC.
INSPECTED
ANTI-SLIP TREAD
FERALUN
AMERICAN ABRASIVE METALS CO.
NEW YORK

The ONLY efficient Safety Tread to bear the Underwriters' Label.

PACIFIC
BUILDING MATERIALS CO.

523 Market St. TELEPHONE KEARNY 3333 S. F.

FORUM BUILDING, SACRAMENTO, CAL.
R. A. Herold, Architect

The above is a Progress Picture of the Four Story addition to Sacramento's Largest Office Building, Now Completed.

STRUCTURAL STEEL FABRICATED AND ERECTED BY

The Palm Iron and Bridge Works
(Incorporated)
15th and R. Sts., Sacramento, Cal.

CALIFORNIA ARTISTIC METAL & WIRE CO.
J. T. McCORMICK, PRESIDENT
ORNAMENTAL IRON AND BRONZE
349-365 SEVENTH ST. SAN FRANCISCO

MORTENSON CONSTRUCTION CO.
CONTRACTORS FOR STRUCTURAL STEEL AND IRON
H. MORTENSON, Pres. CHAS. G. MORTENSON, Vice-Pres. and Mgr.
OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS
PHONE: MISSION 5033 SAN FRANCISCO, CAL

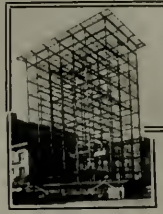
WEST COAST WIRE AND IRON WORKS
MANUFACTURERS OF
ARTISTIC BRONZE, IRON AND WIRE WORK
OF EVERY DESCRIPTION AND FINISH
861-863 HOWARD STREET SAN FRANCISCO, CAL.

FAIR MANUFACTURING COMPANY
J. FEY KERT, Proprietor
ORNAMENTAL AND MISCELLANEOUS IRON WORK
617 BRYANT STREET, SAN FRANCISCO Douglas 5122

THE GOLDEN GATE IRON WORKS
STRUCTURAL STEEL
1541-1549 HOWARD STREET, BETWEEN 11th AND 12th STREETS
Tel. Market 5445 San Francisco

Telephones Mission 139—Mission 59 A. A. Devoto, President
CENTRAL IRON WORKS, Inc.
STRUCTURAL STEEL
Office and Works: 621-651 Florida Street
Bet. Harrison and Bryant, 18th and 19th SAN FRANCISCO, CAL.

The U. S. Government insists upon Good Screening—
Why not you? WATSON METAL SCREENS are specified in Federal Contracts.
Write for Samples, Specifications and Circulars.
RICHARD SPENCER, California Agent
Phone Kearny 2915 801-803 Hearst Building, SAN FRANCISCO



SCHRADER IRON WORKS, Inc.
STRUCTURAL STEEL CONTRACTORS
Fire Escapes, Waterproof Trap Doors, Ornamental Iron Work
1247-1249 HARRISON STREET SAN FRANCISCO, CAL.
Bet. 8th and 9th Telephone Market 337

P. Noble, Pres.
E. B. Noble, Vice-Pres.
A. E. Wilkins, Sec'y

Beam, Angle, Channels, and Universal Mill Plates for immediate shipment from stock

Pacific Rolling Mill Co.

SUPPLIERS OF

FABRICATED STRUCTURAL STEEL, Forgings, Bolts, Rivets, Frogs, Switches, Cast Iron Castings

General Office and Works
17th and MISSISSIPPI STS., SAN FRANCISCO
Telephone Market 215

W. B. MORRIS, President H. M. WRIGHT, Vice-President L. J. GATES, Secretary

WESTERN IRON WORKS

STRUCTURAL IRON and STEEL CONTRACTORS

Gas Holders, Vault Linings, Jails, Fire Escapes, Beams, Channels, Angles and Steel Wheelbarrows Carried in Stock

Phones: Kearny 575
J 1259

141-147 BEALE STREET
132-148 MAIN STREET
SAN FRANCISCO, CAL.

TELEPHONE. MISSION 1763

C. J. HILLARD CO., Inc.

MANUFACTURERS OF

Bank and Office Railings. Elevator Enclosures and Cars.
Cast Iron Stairs and Store Fronts. Wire Work. Fire Escapes.

Nineteenth and Minnesota Sts.
Next to California Canneries

San Francisco, Cal.

Structural Steel
Ornamental Iron
Ornamental Bronze
Prison Work
Vault Work
Metal Furniture
Filing Devices
Library Shelving
Stock Room Shelving
Steel Lockers
Electroliers

RALSTON IRON WORKS

INCORPORATED
TWENTIETH AND INDIANA STREETS
SAN FRANCISCO, CALIFORNIA
PHONE MISSION 5230

Antiquities, Artistic Ornaments for the Interior

A little expenditure adds to your Home Decorations the Grace of Genuineness and Rare Artistry.

A. FALVY

578-580 SUTTER STREET

Tel. Sutter 6939 SAN FRANCISCO

Architects designing hotels, apartment houses, theatres and office buildings, should keep in mind the fact that THREE BARRELS OF FUEL OIL burned by the

Fess System

will equal the heat produced by a TON OF COAL — *Economy for the Owner.*

And that the FESS SYSTEM is the Only Fire-Proof Rotary Burner manufactured — *More Economy for the Owner — Less Insurance to pay.*

Fess System Rotary Crude Oil Burners

FOR HEATING, POWER, COOKING

Office and Factory — 218 Natoma St., San Francisco

Branches — 1310 So. Hill St., Los Angeles; 428 Alder St., Portland, Ore.; 132 B St., San Diego.

Hipolito

EVEN TENSION

Window Screens Screen Doors

ROLLER SCREENS

For Casement Windows

METAL FRAME SCREENS

SEE DISPLAY AT

Building Material Exhibit

77 O'Farrell St. San Francisco

Simpson & Stewart

FACTORY DISTRIBUTORS

565 16th St., Oakland, Cal.

TELEPHONE LAKESIDE 415

MAY BE OPENED
AT THE TOP
FOR LIGHT
BETTER THAN
WINDOW SHADES
BURLINGTON
VENETIAN BLINDS
can be adjusted to *let in* light and air, yet *keep out* the sun and the gaze of outsiders.
For the home, school, bank and office building.
Look for the name Burlington and be assured of the best.
AND CLOSED
AT THE BOTTOM
FOR PRIVACY

Burlington Venetian Blind Co.

BURLINGTON VT. 365 MARKET ST., SAN FRANCISCO

Illinois Automatic Vacuum and Vapor Systems of Heating

Improved with graduated control. You can have much heat or little as conditions demand. Our Thermo Trap prevents any waste of heat and consequently saves fuel. Used in the biggest buildings and factories all over the United States and Canada.

We also manufacture a full line of Hughson, John Davis, Eclipse Pressure Reducing Valves and Back Pressure Valves, Oil Separators, etc.

"Twenty-five years of quality."

We carry a full line in San Francisco.

ILLINOIS ENGINEERING COMPANY

JAS. I. KRUEGER, *Representative*

559-561 Pacific Building, San Francisco

Telephone: Kearny 3047

TELEPHONE MISSION 1105

Pacific Foundry Company

CONTRACTORS' SUPPLIES

Hand Hot Rollers, Tamping Irons, Smoothing Irons, Sewer Fittings

SEND FOR BULLETINS

18th and HARRISON STREETS SAN FRANCISCO

JOHN A. HOOPER, Pres. FRANK P. HOOPER, Vice-Pres. A. W. HOOPER, Sec'y

Hooper Lumber Company

Wholesale and Retail Dealers in

OREGON PINE AND REDWOOD

17th and Illinois Sts., San Francisco

Car shipments to all Central California Points
Schooner shipments to Bay and River landings

Contractors' House Bills solicited
Phone Market 5313

OIL BURNERS
VACUUM PLANTS
ICE MACHINES

The Three Essentials for the Up-to-date HOTEL and APARTMENT HOUSE.

With a JARVIS Guarantee Your Troubles Are Over.

Home Manufacture—Everything but the motors

T. P. JARVIS MANUFACTURING COMPANY

Phone Market 3397 **275 Connecticut Street, SAN FRANCISCO**

When writing to Advertisers please mention this magazine

GRAVEL

NILES SAND GRAVEL & ROCK CO.

GRAVEL BEDS AND PLANT, NILES, CALIFORNIA
MAIN OFFICE
MUTUAL BANK BUILDING
704 MARKET ST.
SAN FRANCISCO

TELEPHONE DOUGLAS 182

Crushed and screened concrete Gravel and Rock.
Sharp, clean Concrete Sand, or Topping. All from fresh water, thoroughly washed, and in any size or mixture, with or without sand, as desired.
Free from Salt.

A. F. EDWARDS, President
J. M. FABBRIS, Vice-President
J. A. MACKENZIE, Secretary
CHAS. F. EISELE, J. RUBIOLO, Asst. Managers

AMERICAN
MARBLE & MOSAIC CO.

25-29 Columbia Square, San Francisco
Telephone Market 5070
Factory on Canal, South San Francisco Telephone South San Francisco 161

THE BITURINE COMPANY

Specializing in Protective
Coatings for Iron and Steel

STRUCTURAL STEEL PAINT
INTERIOR TANK ENAMEL

Telephone
Kearny 4478

24 CALIFORNIA STREET
SAN FRANCISCO

THE KINNEAR MFG. CO.
COLUMBUS, OHIO

STEEL ROLLING FIREPROOF
DOORS AND SHUTTERS

Agents
Seattle - Portland - Los Angeles - Salt Lake City
San Francisco Office 517 Rialto Building

THE ARCHITECT & ENGINEER

VOL. LI. OF CALIFORNIA No. 1

CONTENTS FOR OCTOBER, 1917

Cover Design—"In the Yosemite National Park"
Edwin J. Symmes, Architect

Page

Frontispiece—Bas Relief by Donatello - - - - - - - 38

Recent Improvements in the Yosemite National Park - - - 39
Frederick Jennings

Government Recognizes Importance of Ceramic Industry - - - 50

Willis Polk Writes to Governor Stephens Anent the State Building Plans - - - - - - - - - - - - - 51

Ideals in Every-Day Architecture and a Passing Tribute to Mr. Willis Polk - - - - - - - - - - - - 53
C. Matlack Price

Recent Work of Mr. E. C. Hemmings - - - - - - - 57

Some Attractive Homes of Well-Known People - - - - - 63

Concrete Pile Construction on the San Francisco Water Front - - 69
Harry E. Squire, Assistant State Harbor Engineer

Severe Test of Reinforced Concrete Structure - - - - - 75

Underpinning the New York Post Office - - - - - - 77

Need of Professional Advice in Interior Decoration - - - - 86
Howard Major

Color Schemes for Suburban Homes - - - - - - - 89
A. A. Kelly

Merits of a Wooden Shingle Roof - - - - - - - - 93
W. A. Robinson

The Fourth California Conference on City Planning at Santa Rosa 96
Chas. H. Cheney, Architect

Condition of Structural Steel in a Building After Seven and One-Half Years' Life - - - - - - - - - - - 99

Published Monthly at 626-627 Foxcroft Building, San Francisco in the interest of
ARCHITECTS, STRUCTURAL ENGINEERS, CONTRACTORS AND THE ALLIED TRADES OF THE PACIFIC COAST

Yearly Subscription $1.50
Single Copy 25 cents

Entered at San Francisco Post Office as Second Class Matter

Copyright 1917 by A. I. Whitney
All Rights Reserved

BAS RELIEF BY DONATELLO

Frontispiece
The Architect and Engineer
of California
for October, 1917.

THE
ARCHITECT
AND
ENGINEER
OF CALIFORNIA

OCTOBER, 1917 Vol. LI. Number 1.

Recent Improvements in the Yosemite National Park

By FREDERICK JENNINGS

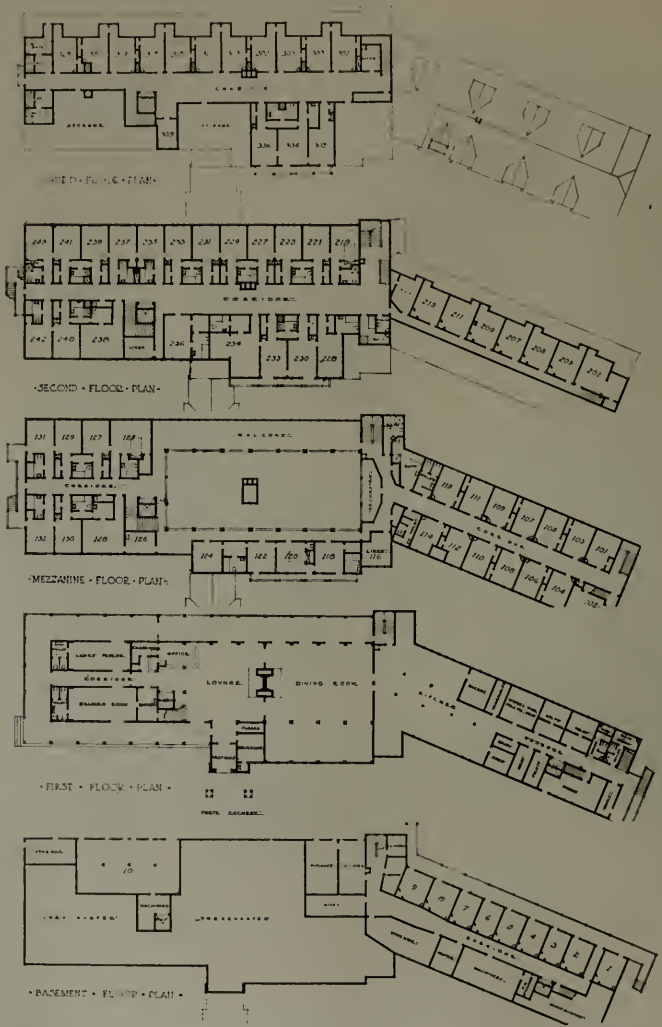
IN these days of concrete, steel and stucco, the architect rarely gets such an opportunity as that which presents itself in the present improvements in Yosemite National Park, of using the materials at hand with which to build.

One goes to Yosemite to see the wonders of Nature, and the architect who builds successfully in such a spot must realize that his art is subordinate to that of his Maker. The work of man should merge into the picture and become a part of it.

That Mr. Symmes has solved his problem successfully is admitted by those who have seen the newly completed Glacier Point Hotel.

The exterior wall surfaces are covered with rough shakes, stained in several shades of grayish and greenish browns, by dipping before being laid, giving the surfaces a "tapestry" effect. The columns, rafters and cornices are finished in the rough, and stained slightly to harmonize with the shakes. The granite foundations, fireplaces, chimneys and other stone work were cut from the mountain side and laid up as "ranged rubble."

It is interesting to note that a large percentage of the rough and finish woodwork comes from the near vicinity. Cedar, fir, white pine, yellow pine and sugar pine logged near Chinquapin, fifteen miles away, were taken down a tramway at El Portal and thence carted to Merced Falls, cut up, dried and sent back up the tramway again, and on to Glacier Point. The redwood shingles and Douglas fir joists, rafters, truss members and flooring were all shipped in from San Francisco.



FLOOR PLANS, GLACIER POINT HOTEL, YOSEMITE, CALIFORNIA
EDWIN J. SYMMES, ARCHITECT

GLACIER POINT HOTEL, YOSEMITE, CALIFORNIA
Edwin J. Symmes, Architect
(From painting by Charles Jorgensen.)

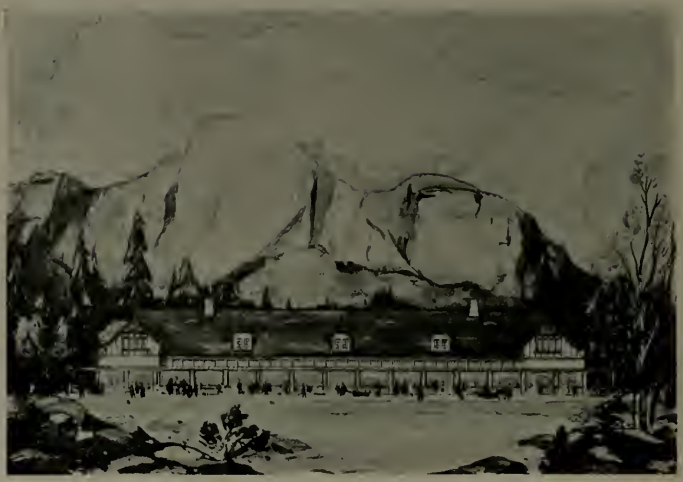
GLACIER POINT HOTEL, YOSEMITE, CALIFORNIA
Edwin J. Symmes, Architect

LOUNGING ROOM, GLACIER POINT HOTEL
Edwin J. Symmes, Architect

DINING ROOM, GLACIER POINT HOTEL
Edwin J. Symmes, Architect

PRELIMINARY SKETCH, BATH HOUSE AND PLUNGE, YOSEMITE VALLEY
Edwin J. Symmes, Architect

SWIMMING POOL, YOSEMITE, CALIFORNIA
Edwin J. Symmes, Architect



PROPOSED APARTMENT-STORE BUILDING, YOSEMITE VALLEY
Edwin J. Symmes, Architect

GARAGE, YOSEMITE VALLEY, CALIFORNIA
Edwin J. Symmes, Architect

BATH HOUSE, YOSEMITE, CALIFORNIA
Edwin J. Symmes, Architect

The new bath house and laundry building on the floor of the valley are finished in the same manner as is the Glacier Point Hotel. The bath house contains modern shower baths, dressing rooms, a massage department, and electric hair driers for women. The tank is of reinforced concrete, lined with tile and terra cotta. The water is filtered, and heated with steam from the laundry.

It is contemplated that all of the proposed improvements in the park shall be finished in the same manner. These improvements comprise practically an entire new village, a new camp site, and a large hotel, all of which will be constructed by concessionaires. In addition, Mr. Symmes has prepared drawings for an Administration Building and a Hospital, which will be constructed by the Federal Government, and of a school building for the Yosemite School District. The construction work of the new village will extend over a period of several years.

* * *

Architects, Too, Have Their Troubles

A newspaper writer quotes a Chicago architect as saying that when a window sticks in a new house the owner calls up his architect, about 2 a. m., to say that the house is a great disappointment and that he is sorry he had it built.

WATER COLOR, COUNTRY HOME OF PROFESSOR C. E. RUGH, LOS GATOS, CALIFORNIA
Edwin J. Symmes, Architect

GARDEN VIEW, COUNTRY HOME OF PROFESSOR C. E. RUGH, LOS GATOS
Edwin J. Symmes, Architect

TOWER, NEPTUNE BEACH, ALAMEDA, CALIFORNIA
EDWIN J. SYMMES, ARCHITECT

BATHING PAVILION, NEPTUNE BEACH, ALAMEDA, CALIFORNIA
EDWIN J. SYMMES, ARCHITECT

POWER PLANT FOR ALAMEDA MUNICIPAL ELECTRIC LIGHT COMPANY, ALAMEDA
EDWIN J. SYMMES, ARCHITECT
MAURICE C. COUCHOT, CIVIL ENGINEER

POWER PLANT FOR BAYSIDE LAND COMPANY
Edwin J. Symmes, Architect

Government Recognizes Importance of Ceramic Industry

SECRETARY OF THE INTERIOR LANE has authorized the establishment of a mining experiment station at Columbus, Ohio, under the jurisdiction of the Bureau of Mines, the station to represent the ceramic industry of the United States. Columbus was selected as the site for the station because it is the capital of the state recognized as the center of the clay-working and allied industries, and also because the Bureau can work in co-operation with the School of Ceramics at Ohio State University and also gain the expert advice of Prof. Edward Orton and Prof. Arthur S. Watts, noted authorities of the subject of ceramics, who are connected with that school.

Director Van H. Manning of the Bureau of Mines in recommending that the subject of ceramics be taken up at this station said: "No industry in this country offers more opportunity for constructive effort and new development than does the ceramic industry. Moreover, the clay working and allied industries represent one-third of all capital invested in crude mineral industries and are, therefore, entitled to the same consideration as other industries now under study by the government. However, the industry is unprogressive, largely on account of lack of technical knowledge. The European research, upon which the progress of the industry has largely depended, is not now available. Moreover, this information is not always applicable to American processes and materials. In the clay working in-

dustries, as in many other mineral industries, the utilization of low grade materials is now imperative in order to prevent exhaustion of those high grade materials, which, if exhausted, would leave us at the mercy of foreign countries.

"In the ceramic industry the fuel consumed represents approximately 20 per cent of the value of the wares produced, and as a rule a great deal of this fuel is unnecessarily wasted. Hence, the value of the fuel wasted is very large, and the lessening of this waste demands immediate study. Moreover, the manufacturing waste due to faulty methods or practice, is very great and at the present time there is no means of subsequently recovering this waste. It is believed that enormous savings can be effected in the clay working industry, but the subject has never been adequately studied, because the necessary outlay has been considered too great for individual firms to make.

"Moreover, manufacturing processes which now endanger the lives and health of employees should be investigated promptly. Investigations upon a laboratory scale have proven inadequate for the preparation of process specifications such as the industries demand before they will adopt less wasteful methods."

* * *

Willis Polk Writes to Governor Stephens Anent the State Building Plans

Sacramento, California, September 28, 1917.

Honorable William D. Stephens, Governor:

In my opinion there were but two points to be considered at your meeting today. They were:

First: Does the accepted design for the proposed State building in the Civic Center at San Francisco conform to the existing buildings or does it not?

Second: What will be the result if this question is not wisely settled?

Regarding the first point, the record is clear. The official program inviting the submission of competitive designs made it mandatory under clause 5 that the State building must conform to the other buildings in the Civic Center. This program contained elevations of all the other buildings. The State Architect in answer to many inquiries during the progress of the competition repeatedly issued official answers stating that the cornice lines of the Civic Center buildings were approximately 68 feet above grade, and that the cornice line of the State building must be at a like elevation. Furthermore, along the lines of conformity the base lines of the Civic Center buildings should likewise be at equal elevations. The accepted design is grossly at variance with such lines. It does not conform either to the base or the cornice lines, and it therefore should not have been accepted. However, it was accepted and perhaps the State is bound to pay the architects for the work they have done, but the State is not bound to build such a building. The State is at least morally bound to build a building that will conform to the other buildings in the Civic Center, and it ought to do so.

As for the second question, the result if a mistake is made may have a more far-reaching effect than the mere spoiling of the Civic Center, it may mean the spoiling of the spirit of artistic renaissance now budding in the hearts and minds of our people and destined perhaps to make Californians famous in the annals of modern civilization.

It is not conceivable that we will at this time, while witnessing the devastation of the world's greatest war—the destruction of some of the world's most famous artistic monuments, calmly submit to the perpetration of such an artistic crime as would be the execution of the accepted design for the proposed State building.

I have reached the conclusion that the reactionary after all is merely human. He is controlled by the weaknesses of humanity rather than guided by intelligence. An intelligent reactionary can seldom be sincere. As Mr. Worcester once said, "Some of us, in order to maintain the equilibrium have to pull one way because others pull the other way."

If the reactionary had always held the reins of thought and power we would still be fighting with bow and arrow. We would still be laboriously carrying the hod.

The progressive on the other hand is just as dangerous when possessed of but ordinary intelligence. Such a character, impatient of precedent, possessing few of the restraints of experience, ignorant of the flowers and fruits of evolution, laboring under the delusion that he is in possession of seven-leagued boots, hoping in one step to annihilate time, places himself decades ahead of the procession, and expects instant recognition. I have forgotten who it was that asked the Almighty to save him from his friends, but whoever he was he must have been a wise man. I imagine that the most expensive luxury in which a really serious-minded person can indulge himself is steadfastness of purpose—I do not mean to say that the successful general should not be willing to make sacrifices for the sake of circumstance, but I do say that the question before your meeting today should not be settled along the lines of expediency, nor should judgment be based upon irrelevant personalities.

Submitted most respectfully,

(Signed) WILLIS POLK,
Hobart Building,
San Francisco.

* * *

San Francisco Engineer Invents New Motor

An improved type of motor, designed upon perpetual motion principles and said to be capable of developing eight times the power of any motor now in existence by the use of waste energy, is the invention of a San Francisco school teacher and electrical engineer, Elbert Craig Kilpatrick, 2501 Twenty-sixth street. Kilpatrick has been conducting experiments since 1873 and has expended $20,000 on models, tools, plans and tests.

The success of the invention is attested by Mr. Arthur Arlett, president of the State Board of Harbor Commissioners; Mr. Benjamin G. McDougall, architect, and Mr. Allen Moyer, real estate dealer, who have financially assisted Kilpatrick to perfect his invention and who have witnessed repeated successful tests of a large working model, which is now completed.

Kilpatrick's secret lies in the utilizing of energy, which since the birth of the electrical motor, has been thrown away or "grounded," as the procedure is expressed in a technical sense.

The inventor utilizes both positive and negative currents and by combining the two, quadruples the power ordinarily obtained from the present-day motor.

Ideals in Every-day Architecture and a Passing Tribute to Mr. Willis Polk

By C. MATLACK PRICE*

IT is an unfortunate circumstance that the concept of "architecture," to most people, is limited to libraries, art galleries and other public buildings. These, they feel, are "architecture"; and "architecture," to fulfill the most popular conception of it, must have Greek columns, and be executed in stone, on a scale more or less grand, and at an expenditure of equally conspicuous scale.

So far as this general popular estimate goes, it is an excellent and highly desirable thing. The people of every town and city, the people even of every village, should be keenly interested in the architectural merit of every public building which is being erected with city funds. They should demand the highest order of architectural merit, and should come to learn some intelligent discrimination between architectural merit and financial expenditure. The library, for example, in a neighboring town, may have cost several thousand dollars more to build than the library in one's own town, but it may not necessarily be better architecturally.

By all means let any community, be it large or small, secure as large a building fund as possible for its important civic edifices, but let the members of the committee, as well as individual citizens, make every effort toward the intelligent expenditure of their money. Let them remember that a large building of poor or mediocre design is far less a credit to the community than a small building which is a model of harmonious, appropriate and well-studied architecture.

The only relationship between "architecture" and "expenditure" legitimately to be reckoned is to be found in the application of money for the execution of a project of nobler architectural character than would be attainable with a smaller expenditure. Mere size, mere inherent expense in materials used—these things, often looming important to an inexperienced building committee—bear no relation whatever to architecture. A building of poor design, though large in size, is, in fact, proportionately more deplorable than a small building of poor design, representing as it does a greater waste of materials and money, as well as the loss of a greater architectural opportunity.

But comment, so far, has been directed toward those buildings which represent the rather confined popular conception of "architecture." If it came to be recognized that "architecture" may find expression in every form of building—what beautiful transformations might be wrought! Architecture, called by way of partial definition "the art of building beautifully," should not be confined to public or monumental buildings—it should realize its true mission of beautifying what we now regard as "every-day" commercial, utilitarian edifices.

Recent years have seen a marked advance in the architectural treatment of office buildings, shops and even "loft" buildings—the last built essentially for commercial purposes.

"Architecture," indeed, as applied to building, has been proved a beneficial asset rather than an esthetic ideal. Several architects of Chicago and the Middle West have attained remarkable success in distinctly architectural renderings of factory buildings; and to point the moral of this brief essay, a few illustrations are presented to show that architectural

* Hoggson Magazine.

TWO POWER PLANTS DESIGNED BY WILLIS POLK & COMPANY, AND PRAISED BY C. MATLACK PRICE FOR THEIR ARCHITECTURAL DIGNITY AND GRACE

ideals are by no means incompatible with a type of building usually regarded by most of us as "hopelessly" utilitarian—buildings for power houses and pumping stations.

A Pacific Coast architect, however, has distinguished himself for years by his unusual rendering of this type of building. "Plants" which, in most instances, have been accepted as irremediable blots upon their immediate localities, have been given the architectural dignity and grace which are commonly regarded as the special perquisites of "architectural" buildings, such as libraries and the like.

Perhaps the spell has been broken—perhaps those people who need most to dream dreams and see visions of architectural beauty have been and are being gradually awakened, by the patient endeavors of a few earnest and inspired architects, to a realization that there may be ideals in every-day architecture—that a garage may be a beautiful building, a storage warehouse a structure of fine dignity and strength, and that a factory may be clothed in an architectural nobility of concept which will be commensurate, in terms of the better and final ideal, with the commercial significance of the great industry which it houses.

* * *

Fireproof Shingles

A field for investigation of tremendous importance to the industries affected lies in an attempt to discover a satisfactory treatment for wood shingles that will render them measurably fire-retardent. No process can ever make wood "fireproof," for no class of material will resist fire under all conditions. Innumerable experiments have been made to demonstrate the efficacy of various compounds, but conclusions of practical value have never been reached. While tests have proved certain treatments to be suitable for one particular condition, such as retarding fire, the substances used have failed to embody equally valuable qualities of permanence and weather resistance. A good shingle fire-retardent must also have endurance, insolubility, attractiveness and cheapness.

With the discovery of a satisfactory method of treatment, there does not appear to be any sufficient reason why shingles should not become a most desirable roof covering for dwellings and other buildings outside congested areas. They have adaptability and beauty superior to most roofings, and entail the least first cost. Since the temporary nature of many of our buildings, the migratory tendencies of our people and the rapid development of our cities and towns are factors making the use of wooden construction advisable, to attempt to legislate the shingle or the frame dwelling out of existence is both uneconomical and impracticable in Canada at the present time.—Conservation.

* * *

No, Indeed

"I understand," said one of the neighbors to our own Mrs. Partington, "that you had a lot of disputes with the contractor who put the lighting into your house."

"Yes," replied that good lady, "but I soon decimated that I wasn't to be insulated by any little electrocutionist!"

COLONNADE, SOLANO COUNTY COURT HOUSE
E. C. HEMMINGS AND W. A. JONES, ASSOCIATED ARCHITECTS

Built of McGilvray Raymond Granite

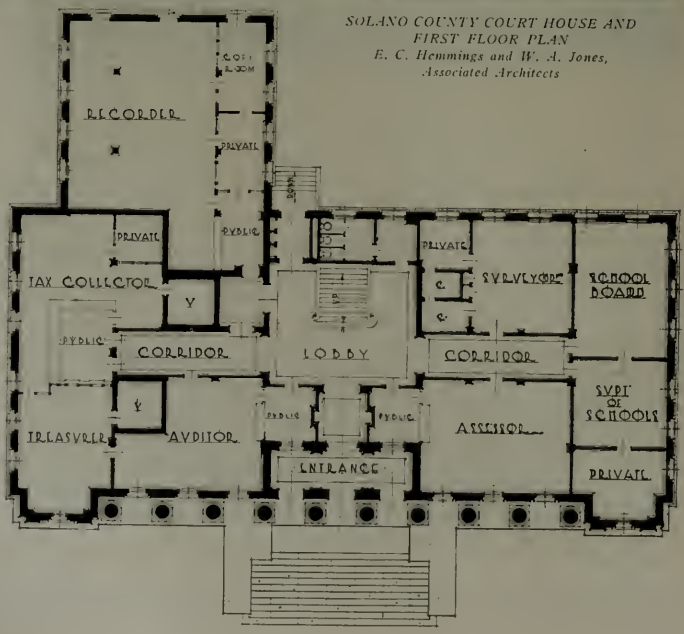
CORRIDOR AND STAIRCASE, SOLANO COUNTY COURT HOUSE
E. C. Hemmings and W. A. Jones, Associated Architects

Recent Work of Mr. E. C. Hemmings

SOME of the recent work of Mr. E. C. Hemmings is shown in this number of The Architect and Engineer of California. Mr. Hemmings has established a very successful practice in Sacramento, having made the Capital city his home since the administration of former Governor Gillette, at which time Mr. Hemmings was associated with Mr. Geo. C. Sellon, the State Architect. Mr. Hemmings' work shows a refinement that undoubtedly has come from constant study and close application. One of his best works is the Solano county court house, a fine example of the pure Classic. The main facade of this building is beautified by a series of Ionic columns which give it a monumental feeling and at the same time is suggestive of a public edifice. Mr. W. A. Jones of Vallejo was associated with Mr. Hemmings in the design and construction of the court house.

It is a matter of some satisfaction to the architects that the building was built and fully equipped within the $250,000 appropriation; in fact, there was a small balance which was used to good advantage for planting and landscape work. The exterior is finished in Raymond granite, while hollow metal trim is used throughout the interior.

The Sacramento Y. M. C. A. building is a five-story steel frame structure that has been pronounced one of the best planned Young Men's Christian Association buildings on the Pacific Coast. The architecture is

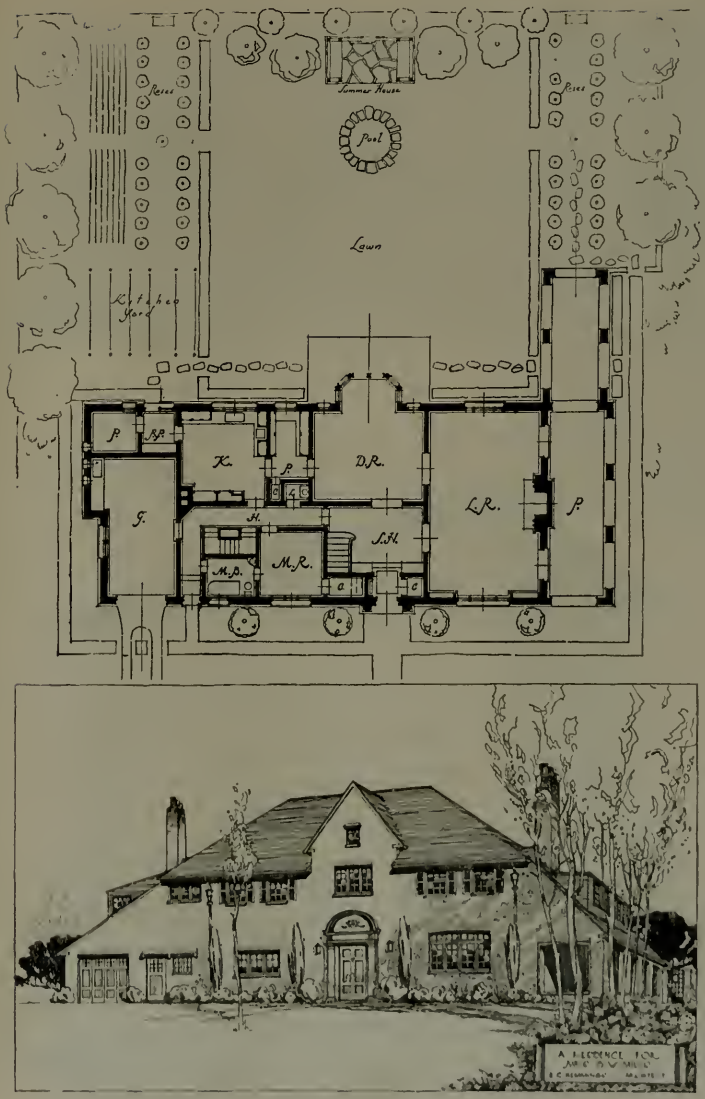


SOLANO COUNTY COURT HOUSE AND FIRST FLOOR PLAN
E. C. Hemmings and W. A. Jones, Associated Architects

ENTRANCE TO SUTTER CLUB, SACRAMENTO
E. C. Hemmings, Architect

Italian, with wide cornice, suggestive of the Spanish school. The building is faced with a soft cream pressed brick and terra cotta. Other buildings designed by Mr. Hemmings and illustrated herein include the Pacific Gas and Electric Co.'s office building in Sacramento, designed with a reinforced concrete frame, brick and terra cotta face and entire interior finished in hardwood; entrance and club rooms of the Sutter Club; Washington school building in the outskirts of the Capital city, and residence for Mrs. G. W. Mills. This residence is built of English hand-made red brick with thatched roof, brick garden walls, terraces, pool, and carefully studied planting effects.

BUILDING FOR YOUNG MEN'S CHRISTIAN ASSOCIATION. SACRAMENTO. E. C. HEMMINGS. ARCHITECT



SKETCH AND FLOOR PLAN, RESIDENCE FOR MRS. O. H. MILLS, SACRAMENTO
B. C. HEMMINGS, ARCHITECT

WASHINGTON, YOLO COUNTY, GRAMMAR SCHOOL
E. C. Hemmings, Architect

BUILDING FOR PACIFIC GAS & ELECTRIC COMPANY, SACRAMENTO
E. C. Hemmings, Architect

RESIDENCE, MR. S

Another striking C
Texas, Mr. H. B. Th
of Western stories.
An interesting Cali
designed by Messrs. A

RESIDENCE, WM. SEWELL, ESQ.
Altadena, California
A. D. Hill, Pasadena, and J. S. Burley, New York, Architects

Some Attractive Homes of Well Known People

BY way of comparison with our domestic architecture in California, is shown this month a number of pictures of Eastern residences owned by well-known people and designed by equally well-known architects. They indicate a diversity of style and in several instances remind one not a little of some of our San Francisco and Bay District architecture. Most people have a great interest in the homes and private life of well known persons. Though this is often distasteful to them, it is one of the penalties they must pay for being great.

The winter home of Mr. John H. Hanan at Miami, Fla., is a good example of Colonial architecture by Mr. August Geiger. The owner's name is familiar to practically every one who wears good shoes, he being the president of the Hanan Shoe Company. The photograph of the house which overlooks the Atlantic ocean, was taken before the place was entirely

ESTATE OF MR. W. L. FLANDERS, MIAMI, FLA.
Gordon K. Mayer, Architect

WINTER HOME, MR. JOHN H. HANAN, MIAMI
August Geiger, Architect

finished. The grounds are now being beautified and other landscape features are being arranged for.

The house of Mr. Carl G. Fisher, president of the Prest-O-Lite Company, is shown on this page with the Hanan house, both of which were designed by Mr. Geiger.

Adjoining the Fisher house at Miami is the private estate of Mr. Walter E. Flanders, president of the Maxwell Motor Sales Corporation. The two houses shown were designed by Mr. Gordon E. Mayer, architect.

HOUSE OF MR. CARL G. FISHER, MIAMI, FLA.
August Geiger, Architect

RESIDENCE, MR. S. B. NEWBERRY, SHAKER HEIGHTS, CLEVELAND, OHIO
Meade & Hamilton, Architects

Another striking Colonial home is that of Mr. George Patullo at Dallas, Texas, Mr. H. B. Thompson, architect. Mr. Patullo is the famous author of Western stories.

An interesting California home is the William Sewell house at Altadena, designed by Messrs. A. D. Hill of Pasadena and J. S. Burley of New York. This place is much favored in its location at the foot of Mount Lowe. On the mountain in the background of the home is the famous Mount Lowe Observatory and the grandeur of the scenery thereabout is known to every traveler in California.

In the foreground of the residence may be seen the swimming pool and sunken garden, not yet finished when the photographs were taken. The

RESIDENCE, MR. GEORGE PATTLLO, DALLAS TEXAS
H. B. Thompson, Architect

RESIDENCE, MR. FRED C. CHANDLER, SHAKER HEIGHTS, CLEVELAND, OHIO
Geo. Ritchie, Architect

RESIDENCE, MR. M. A. ARNOLD, HIGHLANDS, SEATTLE, WASH.
David J. Meyers, Architect

HOUSE OF MR. JOHN T. HEFFERNAN, SEATTLE, WASH.
Cutter & Mahlgren, Architects

smaller illustrations give a glimpse of the interior and of the architectural detail of one of the entrances.

Two Seattle, Washington, homes are shown—one of them designed by Mr. David J. Meyers for Mr. M. A. Arnold, President of the First National Bank of Seattle. It is in the English half timber.

Messrs. Cutter & Mahlgren have designed an English Tudor home for Mr. John T. Heffernan, President of the Heffernan Engineering Works. The house is located on Washington boulevard, Seattle, and its beauty is enhanced by the wonderful setting of trees in the background.

The palatial residence of Mr. Fred. C. Chandler at Shaker Heights, Cleveland, Ohio, was designed by Mr. George Ritchie. The owner is president of the Chandler Motor Car Company. Not far from the Chandler home is the estate of Mr. S. B. Newberry, president of the Sandusky Portland Cement Company. Messrs. Meade & Hamilton were the architects.*

* * *

Architecture and the War

LET us look a little at what the war is compelling builders and architects to do. Has it not always been an axiom of the artistic world that to develop the art instinct the artist must travel? He must see the work of other countries, must compare it with what he finds in his own; he must bring back with him sketches of what he finds beautiful and appropriate, and in designing for his own country substitute or combine as his judgment dictates. In the years when architecture was a living art this was an essential part of the architect's education, and the best architects were invariably those that had enriched their knowledge with a liberal study of the art of foreign countries. With the great increase in numbers in the profession the proportion of those that have studied outside their own country has fallen greatly; they are content with the study of sketches and photographs now so freely circulated; the time and expense of foreign study are saved; the result is a cramping of the art. But what the profession had ceased to do for itself the war is doing for the profession. It has caught up the profession bodily and carried it out to fight in France, in Belgium, in Italy, in Greece, in the Balkans, in Turkey, in Egypt, in Mesopotamia, even in India.

Architects in great numbers have now observed some of the works of these countries and cannot have seen them without learning something from them. They have lived among these works, have experienced the climate and seen the atmosphere in which they exist, and so have learned at first hand the why and wherefore of their specialties. Such men must naturally return home with a greatly widened view of their profession; their education in the fitness and appropriateness of features in design must be very much extended; they are not likely to slip into incongruity; nor will they be blind to opportunities of introducing forms and features in their work that have impressed themselves on the mind abroad but could not be so much as seen at home. It is they who must be looked to to break down the barriers that have circumscribed the art of home, just as we look to seasoned soldiers to storm the trenches.

Why do we not get beyond the eternal round of Renaissance in our public buildings, of a bastard Gothic in our ecclesiastical architecture, and of a modified medieval style in our domestic building? It is because we are hide-bound by convention and lack the courage to break through. Courage

* The illustrations are shown by courtesy of The Interlocker, published by the Denison Interlocking Tile Corporation, whose tile was used for the walls of the several houses pictured.

comes from conviction; those who have seen, have experienced, and been convinced of new possibilities in architecture, may now take the lead, and as there has sprung up a strong feeling that the after-war world must be more cosmopolitan, so, let us hope, that same world will see some more cosmopolitanism in architecture. For, after all, the truest definition of architecture is that it is an expression in form of a people's feeling.—Indian Engineering (Calcutta).

* * *

Joints in Concrete Roads

Road builders have been laying concrete roads for a number of years, but they still differ radically regarding the necessity of leaving joints across the roadways every 30 to 50 ft. to permit the concrete to expand and contract with temperature and moisture changes without cracking. Some engineers believe that these joints do not prevent cracking and that it is better to lay the concrete without joints except where the day's work ends. They believe that the cracks in well-built roads are unimportant, and the most serious objection to them is the appearance of the black streaks across the gray concrete where the cracks are filled with bituminous material and sand by the repairman. They consider that joints merely add to the number of seams that must be filled with this material. The public riding over roads with these black streaks is liable to think that the pavements are failing when they are merely showing the natural effects of the expansion and contraction of concrete. There are more engineers, however, who hold that joints should be left at regular intervals. They are placed about every 30 ft. apart in Connecticut, for instance, where the state road authorities believe that a straight, well-made joint can be much more easily cared for than any ragged crack which might result if no joints were used or if the distance between them were lengthened. The subject is of much interest to road builders, because it is one of those features of their work where only the experience of a number of years will give the knowledge to decide correctly what is the best practice.

* * *

Third Time is the Charm

The central span of the Quebec cantilever bridge was successfully bolted into place on September 20, thus linking together the arms of the largest bridge of its kind in the world. The hoisting operation began on Monday morning, September 7, and the span, which weighs 5,000 tons, was lifted by hydraulic jacks a distance of 150 feet from pontoons on the St. Lawrence river.

The day's work brought to an end the critical part of the operation, virtually completing the structural part of the bridge. An effort last year to raise a similar span in place resulted in disaster, when the link slipped from its supports, causing fourteen deaths, and in 1907 a bridge in the same place collapsed, when it was practically complete, killing seventy.

The successful completion of the bridge will mean the fulfillment of a fifty-year engineering dream. It will be some months before trains can run over the structure, as there is much detail work to be carried out. The running time between Halifax and Winnipeg will then be reduced half a day. One detail is the painting of the bridge, which, it is estimated, will take three years and cost $35,000.

Concrete Pile Construction on the San Francisco Water Front

By HARRY E. SQUIRE, Assistant Harbor Engineer

BEGINNING with a limited use in the ferry slip apron supports some six years ago, reinforced concrete piles have been gradually developed and extended, so that today they are in general use by the Harbor Board for all the sub-structure construction which in any way requires or approaches permanency, and have practically supplanted the various forms of concrete sub-structure previously used, such as cylinders and concrete encased wooden piles. While six years is entirely too short a time to form an adequate idea of their resisting qualities, they have thus far proven entirely satisfactory and the experience gained by the gradual extension of this type of construction has resulted in the use of longer piles, heavier loads, lighter reinforcing and in general an increasing confidence in this type of design.

The typical San Francisco pile is square in section, 16x16 inches, 18x18 inches, or 20x20 inches, depending on the length of the pile. The corners are beveled 1½ inches and the driving end shaped to form a blunt wedge, 10 inches wide at the point. The wedge-shaped end facilitates driving by reducing the tendency of the pile to turn or deflect. The shape of the pile lends itself readily to inexpensive form work, the piles being laid close together in parallel rows, and cast in tiers by raising the side wall forms and separating the top and bottom with building paper. Furthermore the shape is such that it is extremely easy to secure a first-class job of concreting, the concrete being easily deposited through the open side of the pile and readily tamped and inspected.

The concrete used is a 1 to 5 mix, the aggregate being graded and proportioned by laboratory analysis to secure density and imperviousness. The proportions vary somewhat, but the following mix, now in use on Pier No. 31, is typical:

Cement, 5 parts; Rio Vista sand, 2½ parts; Napa sand and gravel, 7¼ parts; No. 4 rock, 5 parts; No. 3 rock, 10 parts.

This mix has given satisfactory tests of from 2000 lbs. per square inch to 2500 lbs. per square inch, in twenty-eight days. Excessive use of water in mixing is not permitted, the concrete being mixed just wet enough to flow with light tamping, but not wet enough to separate. Every precaution is taken to secure the very best concrete possible on the theory that only the very best will resist the disintegrating action of sea water. In fact, it is the very ease with which good concrete can be poured in the pre-cast pile, as compared with other types of sub-structure where the concrete is deposited only with great difficulty and ingenuity, which recommends the pile so strongly for harbor use.

The reinforcing consists of deformed bars wrapped especially with No. 3 wire to form a rectangular cage, which is lowered as a unit into the pile form.

The early type was composed of eight bars, distributed three bars on each side, thereby producing a pile equally strong about either axis. The reinforcing was proportioned in these piles for an assumed pick up or support at two points—one-fifth the length of the pile from each end. In Pier No. 35, April, 1913, 20-inch piles 90 feet long were designed with eight 1-inch square bars. The contractors picked up these piles at four points by means of two bridles and, longer piles being required, the length was increased to 106 feet without change in the reinforcing.

Draftsman's File Intersections Tracing No 10, Revised

San Francisco, California, August 14, 1917

BOARD OF STATE HARBOR COMMISSIONERS
DEPARTMENT OF ENGINEERING.
DATA re REINFORCED CONCRETE PILES

Type	Auxiliary Reinforcement Spiral Hoops	% min. steel in pile at top of batter	Cu. in. concrete in 1 L—m		Barrels per Pile	Safe Working load on piles @ 2250 lbs per sq. in. using 8 bars each in		Cost per Pile Complete in Place		Barrel Displacement in cu. ft.
1	2	3	4	5	6	7	8	9	10	11	12	13
3/4 - 0 - 16	— to 45	7.65	1.90	1.75	2.00	263	214,500.	Inch pounds	142	2.24	13.62	1.125
7/8 - 0 - 16	46 to 60	10.50	1.90				290,600.		141	3.08	13.56	1.531
3/4 - 0 - 18	— to 50	7.65	2.21	2.22	3.00	333	246,000.		194	2.24	15.62	1.125
7/8 - 0 - 18	51 to 60	10.50	2.21				333,500.		193	3.08	15.56	1.531
7/8 - 3/4 - 18	61 to 70	13.25	2.21				333,500.	456,000	193	3.08 1.12	15.56	2.094
7/8 - 7/8 - 20	71 to 79	14.25	2.54	2.75	4.17	4.13	376,400	564,700	253	3.08 1.12	17.56	2.297
1 - 3/4 - 20	80 to 89	16.13	2.54				490,000.	627,900.	252	4.00 1.12	17.50	2.563
1 - 1 - 20	90 to 95	18.37	2.54				490,000.	735,000	252	4.00 2.00	17.50	3.000
1 1/8 - 1 - 20	96 to 100	22.24	2.54				618,000.	862,100.	351	5.10 2.00	17.44	3.531

Type designation in Col 1 consists of dimensions in inches of sides of square bars and pile:- "corner bars-middle bars-pile".

Pile piles shall show ... Axis "N" shall be kept horizontal in handling.

Steel shall project NOT less than 24 diams. Steel shall be free from ... Length ... Elevation ... shall be more than 36 diams.

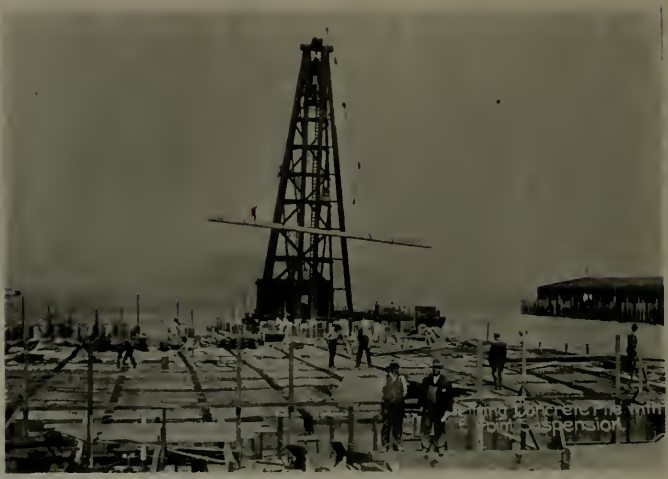
Concrete shall be ... Special ... For detail of pile cap (always required) see 3067-36.

Partly as a result of the satisfactory manner in which these piles handled, and partly because of the increased price of steel, the reinforcing has been reduced to four bars extending the full length and two bars in the top and bottom sides only, extending about three-fourths the length of the pile, thereby producing a pile which is not of equal strength about either axis, but which is designed for careful handling and a certain definite pick up. The piles from 70 to 90 feet long are picked up at four points, the bridles being attached at the 1/8, 3/8, 5/8 and 7/8 points. The piles from 90 to 100 feet long are picked up at five points, the bridles being attached at the 1-10, 3-10, 5-10, 7-10 and 9-10 points. The runners are attached to the bridles by means of sheaves which run in the bight of the bridle and distribute the load as the pile is raised from the horizontal to the vertical position. Because of the sheaves, equations can be definitely obtained for the reactions at the points of support, and the stress readily computed for any position of the pile. In the table submitted the steel has been proportioned from experience. The bending moments obtained by computation are about half the resisting moment of the piles for a stress of 16,000 lbs. per square inch on the steel. Piles of this type in lengths up to 100 feet are being successfully handled on Piers Nos. 3 and 31, as many as twenty-four piles being driven in eight hours.

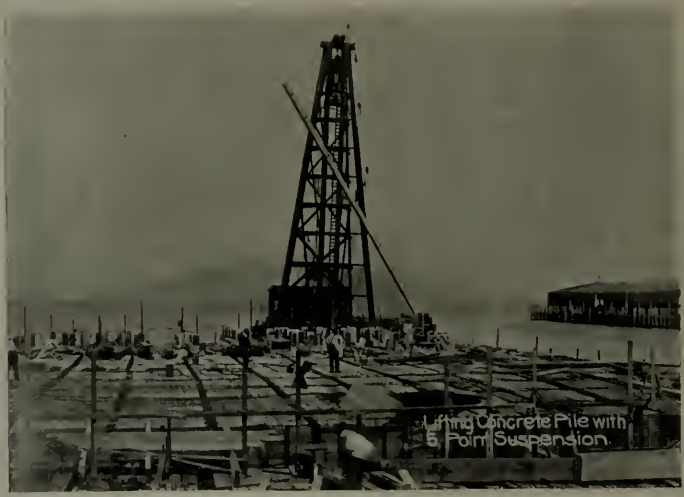
Piles are allowed to set for forty-five days before being handled or driven. They are usually skidded to the water and loaded on barges by means of bridles similar to those previously described. A close examination of the piles after handling often disclosed fine cracks, undoubtedly due to the stress on the tension side exceeding the tensile strength of concrete. Provided the steel is not stressed beyond the elastic limit, the cracks close again when the pile is in a vertical position. Sometimes they develop with the mere turning of the pile and apparently indicate a condition of initial stress in the concrete. A majority of the piles, however, do not show cracks, indicating that these piles are handled without exceeding the tensile resistance of the concrete. This is ideal handling, for while it is believed that the fine cracks do not seriously impair the concrete, they constitute an uncertainty and should be reduced to a minimum. For this reason it is believed that the present practice of less reinforcing and more careful handling will give better results than the earlier practice of 8-bar reinforcing combined with systems of handling which produced very high stress in the concrete. The piles are raised by a heavy pile driver rig of the ordinary type and driven with a steam hammer, a water jet being used in some cases.

In the earlier designs the piles were figured to carry a loading of 30 tons. In the present designs this has been increased to 40 tons, both when the pile is driven to a hard stratum and when it is floated by means of skin friction. On Pier No. 3, where the piles were figured for 35 tons, some of the piles were driven so easily that an actual test was deemed necessary. A 20x20-inch pile 95 feet long, which showed a penetration per blow of four inches under a 7500-pound hammer falling four feet, was loaded with 43 ton of rail. The pile showed an initial set of one-half inch during the loading and of one-quarter inch during ten days that the load was applied. During this time the mud was subjected to vibration due to the driving of additional piles. This pile was embedded 70 feet in mud so soft that the pile settled through 63 feet of mud under the weight of the pile and steam hammer.

On Pier No. 29 two tests were made on 18x18-inch piles 80 feet long, embedded about 50 feet in a much stiffer bottom. These piles showed no



LIFTING CONCRETE PILE WITH FIVE-POINT SUSPENSION, PIER 3, SAN FRANCISCO WATER FRONT



LIFTING CONCRETE PILE WITH FIVE-POINT SUSPENSION, PIER 3, SAN FRANCISCO WATER FRONT
J. D. Hannah, Contractor

CONCRETE PILE REINFORCEMENT IN FORMS, PIER 31
SAN FRANCISCO WATER FRONT

SIX BAR CONCRETE PILE REINFORCEMENT, PIER
SAN FRANCISCO WATER FRONT

settlement under 45 tons load, but settled three-quarters inch and 1 inch respectively when the load was increased to 105 tons.

The present limit of 40 tons per pile is satisfactory for design and seems to be conservative as checked by these tests. The length of pile required for carrying the loading is determined by driving wooden test piles over the area of the pier, and recording their penetration.

The first concrete piles driven have been in place about six years, but are inaccessible for careful inspection. An inspection of the piles in the bulkhead wharf of Pier No. 17, in place five and one-half years, showed practically no deterioration, and after scraping away the marine growth the surface of the pile was found to be in perfect condition. Very few defects could be found and these were minor in effect and apparently existed at the time the pile was placed.

Anyone who inspects concrete work exposed to the erosive action of the sea must be impressed by the relentless way in which sea water seeks out defects, exposes the joints and poor spots and works around deposits of good concrete. The life of many structures which fail would be prolonged years by a uniform concrete equivalent to the best in these same structures. The pre-cast pile is built under conditions which insure uniform concrete of the best quality. The concrete is set and cured in the air for at least forty-five days before being exposed to the sea water, and its quality is furthermore tested by the heavy strains imposed by the handling and driving. While the six years' experience of the San Francisco Harbor Board is not long enough to be conclusive, the results indicate that for the climatic conditions of San Francisco Bay the disintegration of such concrete is practically negligible and a comparison with other types of concrete work exposed for a like time is very favorable to the pre-cast pile.

* * *

Less Marble From Italy

Consul B. H. Carroll, located at Venice, Italy, reports to the Department of Commerce that the marble quarries of Italy have heretofore made large shipments of marble to the United States, but that shipments to this and other countries are diminishing because of high freight rates and "high customs duties." We are glad to know this. We have been sending about a million dollars a year to Italy to pay for marble, and went under that amount only after the war began. Mr. Carroll says that the wages of marble sawyers run from 58 to 68 cents and of finishers from 87 to 97 cents per day. Perhaps that accounts in part for the importation of Italian marble. At any rate, says an exchange, we are thoroughly convinced that anyone who wishes to buy marble "made in Italy" can afford to pay a stiff import duty. The Democratic administration cut the import duty a little—about 15 per cent—but the war prevented our learning by experience just what the effect of that cut would be. In 1914, while the reduced rates were in effect, all building operations were at a standstill and people were not buying marble produced in either Italy or America. This is shown by the report of Secretary Redfield on the marble industries of Vermont. That report shows that the number of wage earners in the marble industry in that State increased 73 per cent from 1899 to 1904, and 28 per cent from 1904 to 1909, but fell off 13 per cent in 1914 as compared with 1909.

* * *

Muscle may drive the nail, but it takes brains to start it.

Severe Test of Reinforced Concrete Structure

THE reinforced concrete arch, and the reinforced concrete cantilever gallery which it carries, in the theater building at Third and Broadway, Los Angeles, was given a severe test by the city building department recently, and the results show that the structure is practically without a flaw either from a theoretical or constructive standpoint. The structure, including the arch and gallery and side supports, is monolithic and constitutes what builders and technical men consider a bold piece of engineering. The idea of designing the building in reinforced concrete was conceived by Mr. Albert C. Martin, the architect and engineer, when it was found that structural steel for the gallery as originally planned could not be obtained without unreasonable delay.

The cantilever gallery is carried on an arch 10 feet wide, with a clear span of 104 feet, so as to give an unobstructed view of the stage from all parts of the ground floor. A three-hinged arch was first considered, being the simplest and easiest type of construction, but it was found that the hinges alone would cost $15,000, and to eliminate this excessive item Mr. Martin decided upon a bow-spring arch with a segmental curve. The arch, which has a maximum rise of eleven feet, is tied at the haunches with steel rods aggregating 154 square inches in area, which are anchored at either end in steel plates with nuts and encased in concrete. Great care was taken also in designing the cantilever trusses for the gallery, plates and nuts being used at the juncture of various members. The gallery has a maximum overhang of about forty feet, the structure being evenly balanced upon the arch.

Under the requirements of the city building ordinance the gallery was designed to carry a weight of 125 pounds per square foot and the test was made by placing upon it a load of double that amount, 250 pounds per square foot. A total of 1,400,000 pounds of cement in sacks, bricks and sand was placed on the gallery extending the entire length and covering that portion which is carried directly by the arch. A week was consumed in placing the great mass of material, all of which is to be used in the building, and the full load was allowed to remain for a period of about forty-eight hours.

The greatest deflection in the arch under this tremendous strain was only one-quarter of an inch and the greatest deflection in the cantilever gallery was three-eighths of an inch. The greatest deflection at the haunches of the arch was one-eighth of an inch on each end, making a total spread of only one-fourth of an inch. Theoretically, the spread of the arch should have been greater, as the 104 feet of steel, under a load of 16,000 pounds per square inch, which it was figured to carry, would stretch five-eighths of an inch. With double the load figured, the steel should, theoretically, have stretched twice five-eighths of an inch, or one and one-quarter inches. The actual small deflection is explained on the theory that a part of the load which would have been borne directly by the arch is, in reality, taken up by the vertical arches on the exterior of the structure.

The test, besides proving satisfactorily the calculations of the engineer, demonstrated the thorough character of the construction. Greatest care was exercised in pouring the concrete for the arch and gallery and it was permitted to stand for sixty days before being stripped of the forms.

* * *

The balustrade has the high polish, but the little risers get you there.

SYSTEM OF GIRDERS ON SECTIONAL PILES SUPPORTING POST OFFICE AND FIRST SUBWAY DURING CONSTRUCTION OF SECOND SUBWAY IN QUICKSAND UNDERNEATH POST OFFICE BUILDING, NEW YORK CITY

Underpinning the New York Post Office*

THE two-track structure of section 1, route 48, of the dual subway system, New York, forms part of the line connecting the first subway in Brooklyn to the Seventh avenue subway in New York and passes under the Federal Post Office building on Broadway, between Park Row and Mail street, running nearly parallel and adjacent to Mail street.

CONTINUOUS GIRDERS DOWELLED TO OLD FOOTING

The subway, which has a rectangular steel and concrete cross-section about 33 feet wide and 20 feet high in regular section, passes under the subway from West Broadway to William street and extends for about 270 feet under the Post Office building at a subgrade of approximately 50 to 60 feet below street surface and from 14 to 24 feet below original ground water level, which, however, had been reduced about 12 feet by previous subway operations and other recent excavations in the same locality. The water level descended still more during the construction of this section of the subway until at present it is about 6 feet above the lowest point of subgrade.

UNDERPINNING, PILES SUPPORTING CONCRETED GIRDERS WITH SUBWAY ROOF BEAMS ON TOP

The post office, erected by the U. S. Government in 1873, is a massive masonry structure with two stories below ground and five stories above, with heavy interior stone partitions carried on steel beams and cast-iron basement columns, and the granite outer walls carried on masonry footings, all of them having plain concrete spread footings 10 feet wide and 4½ feet

* Courtesy of Contracting.

TESTING SECTIONAL PILE WITH HYDRAULIC JACK

deep extending continuously across the building under the exterior walls and the interior column rows. These foundations, loaded to an estimated average of 2½ tons per square foot, were located about three feet above mean high water level, 15 feet above the ground water level first encountered on this work and 33 feet below street level on coarse to fine red-brown sand with pockets of quicksand overlying bedrock at a great depth. Below water level the sand becomes very fine with a mixture of clay that makes it very unstable.

The upper part of the building was occupied by the post office and by Federal Courts and the subbasement was used for machinery, heating plant and the like. The subway was built without interfering with the tenants, disturbing the work and business carried on there or in any way injuring the building and was accomplished without material obstruction to the street or traffic or disturbing the public.

In order to insure the building against displacement, settlement, and injury due to the deep subway excavation far below its footings in the treacherous soil, it was necessary to first underpin 53 main columns and a large amount of exterior wall equivalent to the underpinning of nearly 800 feet of heavy five-story buildings, and to safeguard 430 linear feet of main building walls within the zone of possible influence by the excavation.

The 53 columns underpinned have estimated loads of from 60,000 to 1,665,000 lb. averaging about 860,000 lb. each. The underpinning, although exceptionally difficult and delicate work, with little or no exact precedent, was safely and

SUMP PIT EXCAVATED AND SHEET PILED WITH CONCRETE WALL FORM PARTLY ASSEMBLED

CONCRETED GIRDERS SUPPORTING OLD FOUNDATION. CONCRETED COLUMNS UNDER THEM BEARING ON SECTIONAL PILES

successfully accomplished in a very simple and efficient manner here described.

Before any excavations were made below them or the integrity of the bearings of any of the foundations had been impaired, continuous lines of horizontal steel lattice girders connecting both sides of all the column foundations were assembled in shallow excavations just below the surface of the sub-basement floor and braced by a system of transverse girders also connected to the column foundations. These girders had sufficient strength to distribute the concentrated column loads and carried the weight of the superstructure over short unsupported spans.

After the foundations had been reinforced nearly 200 pits were excavated under them to an average depth of about 15 feet and in each of them from 4 to 8 steel and concrete piles were driven 5 feet below subgrade, after which connections were made between them and the girders, and the weight of the latter and of the superstructure was transferred to the piles, permitting the excavation for the subway to be made under the old footings and between and around the piles without danger of impairing the support of the building.

Some of the piles interfered with the subway structure, so that after their loads were transferred to permanent supports and they were or are being removed. The remainder of the piles were or will be left permanently in position inclosed in the center and side walls of the subway or outside of its location.

After considerable negotiation, permanent easement for the space occupied by the subway structure, and temporary easement for space necessary for construction operations in the sub-basement, were granted by the Secretary of Treasury of the United States and several months' work was required for the removal and reinstallation of machinery and plant that had been installed in that part of the sub-basement needed by the contractor for construction operations.

After the space was cleared, shallow excavations were made in the sub-basement floor and 16 inches of the old concrete footings were removed on each side of the continuous foundations and a continuous lattice girder 30

inches deep and extending the full length of the building was successively assembled on each side of each of two rows of footings and thoroughly connected to them by 1¼-inch square steel dowel pins drilled into the old footings and having bearings against the members of the lattice girders.

PERMANENT UNDERPINNING PILES BETWEEN SUBWAY TRACKS. TEMPORARY PILE CLUSTERS MARKED 25 TO BE REMOVED

These girders have top and bottom flanges each made with a 6x¾-inch web and two 6x6-inch angles in 15-foot lengths, breaking joints and diagonals consisting of 3x¾-inch flat bars with 6 ⅞-inch bolts or rivets in each end. All flange angles and diagonal pieces were shipped separately and assembled in place and secured by turned bolts or rivets at splices and connections.

Similar lattice girders 15 inches deep were seated on the top flanges of the 30-inch girders on each side of each row of footings to which they were also secured by steel dowels, and thus formed a lateral bracing system giving great stability to the main girders. Both longitudinal and transverse girders were embedded in solid masses of concrete which was thoroughly bonded to the rough cut face of the old footing by the dowels that anchored it securely in place and enabled it to develop sufficient friction and adhesion to transfer a portion of the column loads to the girders without any reliance on the shearing strength of the dowels.

About 170 5x5-foot pits with an average depth of about 16 feet were excavated under the girders and under the old foundations, care being taken that adjacent pits should not be simultaneously excavated. Down to ground water line the pits were lined with horizontal sheeting and below water level the steel piles were driven, as noted below, to a depth of 5 feet below subgrade.

In these pits piles were driven by a 350-pound hammer actuated by an electric pile driver which operated by man power over a drum. About 1,320 14-inch hollow steel sectional piles with an average length of about 20 feet and a maximum length of 22 feet were required.

The piles were of a special type designed by and fabricated for the contractor and were made up with riveted sections 2 feet long of ⅛-inch steel, having 4-inch inside sleeves projecting 2 inches from the lower end of each section to provide for the installation joints. After the piles were driven, the sand was removed from the interior by a Hayward orange peel bucket

LATTICE GIRDERS INSTALLED ON SUBWAY ROOF BEAMS TO DISTRIBUTE FOUNDATION LOADS

of 1 cubic foot capacity.

After being driven to the required depth, the piles were thoroughly cleaned out and filled with 1:2:4 concrete made with ¾ to 1-inch gravel. After the concrete had set, the piles which were designed for 50,000-pound loads were tested by loads of about 80,000 pounds applied by hydraulic jacks reacting against the foundations above.

Short I-beam columns were seated on the pile caps and supported horizontal grillage beams which took bearing against the under sides of the girders and old foundations by means of steel shin plates adjusted in the usual manner with steel wedges and jackscrews. After the loads were transferred to the piles, the I-beams for the subway roof were assembled on the surface of the ground in approximately final position, supported in some cases by the underpinning girders, and 9-inch sections of U. S. steel sheet piles 12 feet long were driven on each side of the subway to safeguard the adjacent foundations not underpinned.

This sheet piling was driven in pits successively adjacent, each pit being backfilled and braced with concrete ribs before the next pit was started.

Most of the underpinning piles were driven to clear the permanent subway structure, but in some cases this arrangement did not provide sufficient support for heavy loads, and additional piles were driven in rows or clusters projecting into the subway. Where this was the case, the interfering piles will be cut off at subgrade and removed after their temporary loads have been transferred to permanent supports.

When it was necessary to carry portions of the building load on the subway itself, transverse 24-inch lattice girders were assembled, bearing against the lower flanges of the main 30-inch girders and were wedged to permanent bearing on the subway roof distributing a portion of the building load over the lattice structure before the temporary pile supports were removed.

Beside the 14-inch sectional piles there were driven about 600 linear feet of 9-inch Simmons steel pipe piles, which were also filled with concrete and capped. The excavations inside the 14-inch piles were generally kept about a foot above the cutting edge so as to afford a seal for the fine sand, and no effort was made to pump out the piles, the concrete being deposited under water with special buckets.

Down to water level, an average depth of about 9 feet, the pile pits were lined with special sheeting units which consisted of horizontal

planking 2 inches thick and 8 inches wide, with lengths alternating between 5 feet and 5 feet 4 inches to give alternate stability to ends and sides.

Considerable ground water was encountered during the execution of the work and was kept down and the elevation of ground water line was gradually lowered by moderate pumping. A permanent sump was established that was drained by two electrically-driven Lawrence centrifugal 4-inch pumps that sometimes worked only 6 or 8 hours in 24.

A cofferdam 9 feet in diameter was made of U. S. steel sheet piles 8 feet long, driven to a penetration of 3 feet below the excavation. In the interior of this cofferdam 9-inch hollow steel piles 10 feet long were driven about 2 feet apart on centers on a circle 6½ feet in diameter, and the space between them and the cofferdam was filled with a concrete wall built in wooden forms.

The contractor commenced operations in April, 1915, and completed the underpinning of the post office in just two years. The transfer and reinstallation of subbasement equipment, other preliminary work, and the construction of the permanent underpinning girders, added about 6 months to this time. The excavation of the underpinning pits and driving of the piles required ten months. An average force of six men was employed per pit and the cost of the underpinning work was probably nearly twice as much as the cost of making the excavation and building the subway structure under the post office after the underpinning was completed.

The work was carried on under the direction of the Public Service Commission, Alfred Craven, chief engineer, succeeded by D. L. Turner, and Robert Ridgway, engineer of subways. The contractor was Frederick L. Cranford, Inc., J. C. Meem, engineer, and H. L. Robinson, superintendent in charge. Captain W. Mc. I. Wolfe was assistant engineer in charge.

Under Park Place, about 100 feet west of the post office, a 50x50-foot pocket of quicksand was encountered about 55 feet below the street. It was so soft that some 14-inch steel piles that had been driven in it to supposedly safe bearing suddenly commenced to settle rapidly. The movement was immediately observed and temporary posts and braces set to support the street and timbering which otherwise would have collapsed. A large quantity of coarse sand was filled in on the quicksand and the pocket probably being shallow, it was stiffened and piles driven to greater penetration, until there was no evidence of further settlement.

* * *

"Both Were Knights"

He was a very decided English type, and as he stopped an Irishman and asked for a light he volunteered to say:

"Excuse me, my man, for stopping you, as an entire stranger. But at home I'm a person of some importance. I'm Sir James B——, Knight of the Garter, Knight of the Double Eagle, Knight of the Golden Fleece, Knight of the Iron Cross. And your name is—what, my man?"

"Me name," was the ready reply, "is Michael Murphy, night before last, last night, tonight and every night, Michael Murphy."

* * *

The Dream

Neighbor—When do you think of building a home of your own?

Newed—All the time.

The Architect in Politics

THE following is a synopsis of the address delivered by President W. G. Malcomson of the Michigan Society of Architects at the annual meeting of the Illinois Society of Architects in reference to the attitude of the United States Government towards the architectural profession:

A large measure of interest has been manifested, and considerable feeling has been justly aroused on the part of some intelligent and progressive members of our profession, in regard to the continued unfavorable attitude of our National Government toward the architectural profession—and the lack of proper governmental provision for suitably locating and wisely planning important national structures to insure the best permanent results, all things considered. Time need not be taken on such an occasion as this to state in detail the situation as it actually exists. You are all familiar with it. It may be assumed here that a statement to the effect that the present condition is deplorable would not meet with a single objection nor an attempt at contradiction in this assembly. Notwithstanding the fact that much effort and expense have been devoted to making known the unfortunate conditions, and also in evident well intentioned improvement of them, it must be conceded that not much concrete advance has been made toward a satisfactory remedy for some time past.

The Institute Journal and other publications referred to therein have done yeoman service in the respective fields of illustrative and other enlightenment, pointed critical comment and recommendatory advice, all of which cannot be too highly appreciated by the architectural profession. Thus far, however, to the interested onlooker, no substantial progress has been made toward a much desired improvement. The fact that so much thought, labor and expense has been productive of so little apparent result is suggestive. May it not be that the methods thus far practiced have conduced as much to provoke a degree of concerted opposition as to produce enlightenment, and that the well intentioned efforts to favorably educate the national statesmen en masse has resulted in a measure of solidified antagonism (which condition, if true, would not be entirely unassisted by a combination of selfish local capital interests)?

May it not be possible that Washington might not be the best place, or at least that the legislative period not the best time, for effective ethical propaganda? Let me not be understood as in any sense criticizing the volume of valuable, painstaking work which has been accomplished, and which no doubt continues to be done; but, as related to, and based upon such necessary and fundamental accomplishment, it may not be out of place to offer a few suggestions of a practical and constructive nature, by the adoption of which, through organizations such as this, Illinois and other State Societies, the valuable material data already prepared and the recorded work now made available by the devotion, industry and foresight of some, may be intelligently used toward accomplishment of the ends so much desired by all.

First: I would say, we should form a National organization whose primary purpose would be to labor for the improvement of relations between the National government and our profession. It has been suggested by your president, Mr. Davidson, that not to be cumbersome, such an organization might be composed of the Executive Committees of the various State Societies and, possibly, also of the Institute State Chapters.

Second: Have a committee appointed by the organization to collect and arrange all necessary facts and data for the prosecution of a general and specific educational propaganda.

Third: Interest the profession generally in the necessity of and plans for improvement by the publishing and circulating of pertinent matter, backed by judicious local personal discussions, fostered by the various State Societies.

Fourth: Carefully select and appoint suitable committees to visit and interview the various statesmen in their home districts—for mutual conference and enlightenment. (These men are in many instances our neighbors—and in some instances our friends; our plea is wise, just, and reasonable, and should—and doubtless would—receive fair consideration in a majority of instances.) Arrange meetings where these statesmen may express themselves among their own constituents—and receive and impart their respective views.

Fifth: Co-operate with and support the efforts of our Washington brethren in the systematic following up of such legislation as may ultimately be decided upon—as being desirable and possible. Much more time might be taken in the elaboration of these suggestions, and the advancing of more ideas—but my present object is not so much to afflict you with a treatise as to leave with you a few seed thoughts with the hope that germination—and consequent fruition resulting from your interested and intelligent consideration, may conduce in large degree toward the practical betterments which we all so much desire.

* * *

What Is Comprehended by "Etc."

UNDER the terms of a contract for the construction of a garage in San Francisco for Mr. Albert Abrams, the Northern Construction Co. was required to construct a concrete building, to be reinforced by steel bars, fabric strips and tying wire. In the specifications, which were a part of the contract, there was a general provision reading: "Bars will be used in all footings, beams, girders, walls, but in no floor or roof slabs."

Following upon the execution of this contract, the Northern Construction Co. entered into a contract with Mr. Edward L. Soule, who was a dealer in and a contractor for the installation of reinforcing steel, by the terms of which plaintiff agreed "to furnish and set in place in a workmanlike manner all reinforcing steel bars, tying wire, etc., required to be used in the construction of that certain building to be erected on the lands hereinafter described in accordance with the plans and specifications for the construction of said building."

Soule contended that under the terms of the contract he was not required to furnish and set in place reinforcing steel for the floors and roof of the building, and omitted so doing in carrying on the work. The misunderstanding delayed settlement and he finally filed a mechanic's lien. In an action to foreclose this lien he obtained a judgment in the Superior Court of San Francisco, but this has been reversed by the District Court of Appeal in an opinion in part as follows:

"Under one provision of the specifications no bars are to be used in the slab reinforcement of the floors and roof, while under another provision it is optional with the contractor as to whether or not in the slab reinforcement of the floors and roof bars or fabric shall be used. There is a conflict between those two provisions of the specifications; but the provision stating that no bars shall be used in the floor and roof reinforcement is general in its character, while the other provision therefore should

control as to the nature of the work to be done on that part of the building. We have no doubt, however, but that under these two provisions the original contractor was required to furnish and set in place either bars or fabric for the floor and roof reinforcement; and this, of course, is required of the sub-contractor unless, as asserted by him, the expression 'etc.' found in his contract is without force, and means nothing.

"He took over the contract for the general installation of the reinforcing steel for the building, and when he did so it was doubtless expected that all work of that character would be done by him; and we think this contract when fairly construed so provides. The contract requires him to furnish and set in place all the reinforcing bars, tying wire, 'etc.,' 'et cetera' abbreviated to the form 'etc.' are said by Webster to be equivalent to the phrase 'others of like kind; and the rest; and so on.' In the case of Gray v. Central R. R. Co., 11 Hun (N. Y.) 70, 75, it was held that the term 'etc.,' as used in a contract for the sale of a boat, where the parties agreed to take the boat, 'provided, upon trial, they are satisfied with the soundness of her machinery, boilers, etc.,' meant 'other things,' referring to other material parts of the boat. The expression 'etc.,' as used in the contract before us, certainly must have been used for some purpose; and we think it means 'other reinforcing material,' which, of course, would include fabric. There is nothing in the case which would warrant us in holding the term to be meaningless. In our opinion its effect, taken in connection with the provision of the specifications above quoted, was to require the contractor to furnish and install bars or fabric in the slab reinforcement of the floor and roof. We think the trial court was in error in exempting the plaintiff from this obligation, and that the judgment should be reversed."

Before entering upon the opinion the court undertook to define many of the purely technical words entering into the contract, as follows:

"A slab of concrete construction is that portion of the structure underneath and supporting the floor and extending between the beams and girders. The beams support the slabs, while the girders are what are commonly termed the long supports, which run a few feet apart longitudinally through the interior of the building, and which are generally supported by the columns. Reinforcing steel bars are small sections of steel made into straight or twisted bars, which are imbedded in the concrete to take up the tensional and shearing strains which are due to the longitudinal load of the structure where such strains are encountered. Tying wire is No. 16 black fencing wire, and is used to fasten the steel together. Fabric consists of a union of drawn wires made up in rows."—Soule v. Northern Const. Co. et al., 105 P. 21.

* * *

A Practical Suggestion

Clancy, the paving contractor, had dug deep and often for the new church. At length it was built and furnished from basement to belfry except for the church bell itself. A meeting of the angels was called to raise funds for the bell. Clancy's turn came. He said: "We've a fine church with fine pews and a fine pulpit. We have a fine steam heatin' plant, too, so I move you that we can this bell idea and put a whistle on the church!"—Municipal Engineering.

* * *

There is a lot of generosity that is like one coat of paint.

Need of Professional Advice In Interior Decoration

By HOWARD MAJOR, in Vogue

SO MUCH has been written of the general principles of interior decoration that it seems a useless repetition to devote further space to the subject; rather I would call attention to a neglected and very important phase of decoration, the matter of choosing the decorator who is capable of applying those principles. The problem of selecting a talented practitioner of any profession is one of great difficulty; but especially in the matter of decoration, this problem is treated in such a light and unintelligent manner (or not treated as a problem at all) that it is rarely and indeed largely by chance that a competent advisor is ever procured. In addition to this, the profession of interior decoration is at the present time surrounded by confusing conditions and has a greater proportion of incompetent practitioners than are to be found in the other professions, so that the problem of choice is rendered even more difficult.

It would seem, therefore, that to present some facts of the conditions now existing in this profession and to differentiate clearly between "the trade of decorating" and "the profession of decorating" should prove more interesting and helpful than a further discussion of decorative theories. Professional advice in decoration is as necessary as architectural advice in building. This is not generally understood, nor was it generally understood thirty years ago, when constructors were building miles of brownstone fronts, that an architect was necessary; but we have progressed, and an architect's advice is now considered indispensable even in the construction of manufacturing plants. In a few years the decorator's advice will also be considered indispensable. The average interior of today is almost as bad as the brownstone fronts of yesterday. That these interiors are less monotonously unvarying than the brownstone blocks is almost their only point of superiority.

There are several causes for this lack of true beauty in our homes. First, there has long been a general lack of interest in the subject of decoration, and the resulting ignorance of its importance and its principles is great. This condition, however, is being overcome by the publicity given the subject of decoration in magazines, books, lectures and schools. The awakening of public interest is so apparent that we need not dwell further on this cause.

A second cause is the general idea that the services of a decorator are not necessary. On that point one may well pause to think. Undeniably the average person is not born an artist; even the sense of beauty comes with the training of the eye. Yet by study and experience almost anyone may learn the main esthetic principles underlying decoration and something of its history. It is a notable fact that highly educated and cultured women with a natural fondness for art sometimes become excellent amateur decorators. Their lives bring them in constant contact with beautiful things; they have traveled and spent much time on the continent or in the east, studied the art treasures of Italy, France, and England. These women have absorbed this art and have applied their knowledge to their homes, experimenting, changing, and trying out until the result was most delightful. Women who have had these advantages and who have a keen interest in the subject of decoration may, I believe, safely handle their own problems; but those who lack such training should, by all means, retain a trained advisor; they will thus be saved many regrets.

The third and perhaps the greatest cause of the lack of beautiful interiors in our modern homes lies in the unsatisfactory conditions existing in the profession of interior decoration itself. Four distinct sets of people are professionally interested in this work of making homes.

There are the shops, wholesale or retail, which carry stocks of furniture, fabrics, paintings, and other decorative and useful accessories for the home. These shops are always ready to take entire charge of the decoration of a house. They are, of course, in business to sell their merchandise, as much of it as possible, more or less irrespective of its environment. They stand in the same relation to the professional decorator that the drug store has to the physician, except that the law strictly limits the professional advice which a pharmacist may give, while the shopkeeping decorator is limited only by his client's bank account. Both decorator and shopkeeper (like physician and pharmacist) are indispensable, and these shops import excellent examples of antique furniture, tapestries, other furnishings, and both decorator and client procure much of decided value from them.

Another considerable group consists of decorators without ability and usually without training, who may be successful or otherwise. This class is comprised of amateurs, young "gentlemen" and young "ladies" who "go in for decoration," and women of social position or high connections who find it necessary to earn a living. A great proportion of the successful decorators—financially—are just this type of people, who enter the business from the top and not the bottom. If these decorators are agreeable and have the ability to make friends, they are usually successful from their own point of view. Those who desire a lovely home, however, would do well to remember that the decorator's personality is of no earthly use in the decoration of a house. One might as well select a bond for investment because one took a fancy to its color. Decorators of this class may be easily determined by a few careful inquiries as to the professional training of the decorator in question.

To a third class belongs the decorator of taste and training. Able decorators, like all those who seriously enter a profession, have to devote conscientious years of study, preferably in a school of reputation, and serve an apprenticeship under properly trained practitioners. They should have a clear understanding of architecture and a thorough knowledge of the history of decoration and of the principles of esthetics, especially in their relation to color. They must know the history of textiles and the value and wearing qualities of modern fabrics and a thousand and one other matters. In short, it is necessary to begin at the bottom and work up, establishing a firm foundation for future work. The decorator who has had this training I would recommend. Such a decorator will have but one aim—a successful interior of artistic merit. If they are successful financially, well and good, but that must be a second consideration.

The fourth class of decorators consists of architect—not so great a paradox as it sounds, for what is decoration but the architecture of the interior of the architect's building? Among the architects at the top of the profession are men of careful training and excellent taste, and when such men as these carry through the interior decorations of the buildings they design the results are admirable. The architect, however, will not decorate a building unless he has been the author of it, so that his services are available for only a limited number of cases.

It is apparent that of those who do decoration the third class, the trained specialists in decoration, are those whose help will prove of most

value to the average householder. Much can be learned from an interview, if one will but beware of letting a pleasing personality and a pleasant manner warp the judgment. If a decorator with an unfortunate personality has made a success, it is comparatively certain that the success was made on professional merit. The prospective client should inquire the number of years which have been devoted to study and apprenticeship, examine photographs of work, and, if possible, see actual rooms which have been arranged by this decorator. Consultation with any friends one may have who are engaged in the fine arts may also afford assistance. This method may not lead directly to one of the best decorators, but it certainly will bring about better results than are given by the usual haphazard selection.

Even the selection of a competent decorator, however, does not by any means assure a successful result; much may depend upon the relations of the client and the decorator. Confidence in the decorator selected is essential. The client should strive to maintain a sympathetic and receptive mood towards the schemes submitted for discussion and should allow the designer considerable latitude in carrying out the detail, for his enthusiasm will be in direct proportion to his freedom.

There will unquestionably be moments of doubt as the work progresses, but judgment should be reserved for the completed work. It is difficult for the layman to visualize the results in advance, and what seems a mistake may be the artistic climax of the work. A natural mistake, and one to be carefully avoided, is that of submitting suggestions of the decorator to the judgment of acquaintances. These acquaintances cannot possibly know the many intricate conditions pertaining to the problem in point, and the result of their criticism is likely to be a hopeless bewilderment on the part of the client.

On the other hand, the decorator must constantly endeavor to create confidence. The prevailing shop idea of today must be laid aside. The decorator is selling not merchandise but brains. Large stocks of merchandise are entirely unnecessary for him, though it is advisable for him to collect objects of unusual merit when the opportunity arrives, for such things are hard to procure at short notice.

A last and very important phase is the relation of the decorator and the architect, when both have been retained. The decorations may either make or ruin the architecture; hence it is of first importance to the architect to have a certain amount of authority over the decorator. In any case, it is essential that they work together in harmony. The decorator must relate his decorative scheme to the architecture and an architect should have the proper authority to see that this is done.

The task for the client to secure this harmony amongst his advisors is not, as it first appears, almost hopeless, but is indeed a simple one. If the architect has created confidence, it is well to have him recommend the decorator, who will then feel a moral obligation to the architect to harmonize the furnishings to the background. If the client has faith in a decorator, he should consult with him and if necessary have the decorator recommend the architect, who will then feel the responsibility of working in harmony with the decorator and may even, if necessary, design the house as a background suitable to preconceived ideas of the decorator.

Color Schemes for Suburban Homes

By A. A. KELLY, in the National Builder

HARMONY is the controlling element in the matter of exterior decoration of houses with paint. By harmony is meant that perfect agreement of the colors which will produce upon the vision a feeling of restful accord, no one color standing out from the others, but all combining to form a whole that may be likened to a natural or even a painted landscape. But each house must be considered alone when choosing its coloring, although the same kind of building, if amid the same kind of surroundings, etc., may be painted exactly the same.

In a general way the colors most suitable for houses are red, white, yellow, brown and gray. Still, speaking in a general way, yellow or gray suits a plain, pitched roof or square colonial house. Grays and browns are useful on those nondescript houses that are not exactly pretty to look at. The grays are to be preferred when they run on the yellow, rather than on the blue tones, being warmer. White suits the formal type, like the colonial. White is always fine on those farm houses that are surrounded by trees and shrubbery, amidst which the white sparkles and shines delightfully. Even in winter, when the leafage is gone, the white shows up well.

A rather low-built house requires light and cheerful coloring. This will serve to make it appear higher; whereas, dull colors will cause the opposite effect. Hence dark colors are best suited to tall buildings, in subduing their height. Never paint a colonial house in such colors as brown, red, or any pronounced dark color. Sometimes the house and trim is painted solid white, with dark green blinds and shutters. Or the trim will be bottle green.

Almost any old stone farm house will look well with white or pale yellow walls and white trim, with green blinds and moss green roof. What about the doors? They will do in pure white, or grained oak. Also the walls will look well done in a brownish gray and white trim, with a deeper shade of the wall color for the blinds, or a dark green will do.

It is a pretty safe rule that almost any color of trim will answer on a white-body house. Such trim colors as these, for instance: Pea green, gray, pale yellow, or a very light brown. But when the owner desires a change from white, the body of the house might be made a warm drab, or gray stone, medium drab, light bronze, or ivory white with white trim, or colored trim. In general a house done entirely in white does not look well, but would be better done with a colored trim, like bottle green, gray, or a nice drab. With such trim the white house would show up very much whiter than when done entirely in white. And all white paint on the outside, as well as inside, should be white and not off color a bit. French and pearl gray are nice body colors for a farm house. And a frame house will look well with a slate color body, and light gray trim, black sash, and roof olive green. Another good color scheme is body medium drab, trim ivory white, and sash chocolate brown.

The following color chart may be found useful for reference (the colors named refer to body, trim and sash, in the order given):

No. 1—Pearl gray, pure white, maroon.
No. 2—Cream, light brown, dark bottle green.
No. 3—Ivory white, pure white, maroon.
No. 4—Pure white, dark bottle green, black.
No. 5—Medium drab, ivory white, maroon.
No. 6—Chocolate brown, pure white, white.

No. 7—French gray, pure white, maroon.
No. 8—Colonial yellow, pure white, white.
No. 9—Bronze gray, pure white, maroon.
No. 10—Fawn, pure white, maroon.
No. 11—Gray stone, ivory white, chocolate brown.
No. 12—Slate, pure white, maroon.

Here is another useful color table, it prescribing for various house designs.

For the colonial or formal type: Body white, yellow or gray; trim white, roof natural color wooden shingles or slate; blinds moss green, bronze green, or chrome green, dark or medium, as preferred.

Irregular or picturesque style: Body red; trim red; sash white; roof unstained shingles; if blue slates are used, then do not use red on trim or body. Blinds very dark green; or this scheme: Body brown, trim creamy white, roof moss green, blinds medium chrome green.

Mansard roof style: Body, yellowish gray, trim same, roof is usually slate; blinds green.

Small cottage style: Body red, trim white, natural shingles, blinds dark green.

Cement and stucco: Body white, yellow or gray; trim, brown stain, for white and yellow schemes, white trim for gray body. In all three cases use red for roof; blinds for gray body, pale blue-green.

If given to choose the colors, do not copy from any near-by house. A diversity of colors, all blending harmoniously, affords a pleasing picture to the eye, and when each householder uses taste and avoids copying from her neighbors a group of suburban buildings form a perfect picture.

Summer houses, or any house structure intended only for temporary use, will look best when painted in light, airy colors. More substantial and permanent buildings are better done in darker colors. Brick and stone buildings may have their window and door frames painted the color of their sills and capstone, if any; otherwise any color that will agree with the color of brick or stone.

A fine private stable was painted thus: The weatherboarding a dark drab, stall blinds the same, rain conductors a dark green, doors green with drab panels, and window sash Tuscon or Indian red.

If the stable had shingles on its sides, I would simply oil them. Ditto if bricks. Roof shingles should be dipped in red stain, and brushed with same stain after being laid. The interior woodwork may be finished natural.

Here is a suggestive scheme that may fit in some time: Body a rich olive, white trim; roof moss green, side gable deep buff, sash greenish black, door deep green, porch floor a green between the door and body color, chimney cream.

For a low-posted cottage: Body and trim white, sash black or red, porch floor mossy green or a burnt sienna, shingled roof stained olive green, and chimneys and foundation red.

Some people like a lemon yellow body color. It is rather glaring, but under certain conditions as to surroundings, etc., it does very well. The trim color may be white, a soft harmonizing green for the gables, black sash, roof moss green, and chimneys and foundation red. Such a house should set amid shrubbery and trees.

It is a peculiarity of color that it can make a dark house stand out or recede; hence dark colors are best for the house that has little architectural beauty, or that is small and near larger and more pretentious

houses. The plain square house is one that needs dark and plain coloring. It is well to visit localities where there are fine residences, large or small, and note the colors used.

One can learn more that way than by any reading, because the lessons are illustrated by form and color. Of course, you will meet with some examples of bad architectural form and coloring, but I think this will be found exceptional, at least in places where pains have been taken to get good effects, and, of course, where money has not been stinted. When you come across a very good example of coloring make a mental note of it, particularly if you have in prospect the building of such a structure. There are some very finely colored bungalows that will interest you. These squat buildings are extremely pretty, as a rule, and afford good color lessons, to one interested in such matters. Much of the work is done with stains, as much of the wood finish looks best done in the natural, or at least simply stained, not painted.

I will close with a few suggestions for making up some commonly used colors for painting, not for ordinary good work, but just for what might be called rough painting. A green may be made with Prussian or ultramarine blue and yellow ochre; black and medium chrome yellow make a good brownish green, used for many purposes and saving the cost of the high-priced pigments. Also black and yellow ochre.

These give permanent paints, though that will depend upon the kind of thinning you do. Thinned with linseed oil, it will be all right, but if trimmed with a mineral oil or benzine the paint will not be durable. It may also be stated here that if you use any coal-oil in the paint it will produce scaling later on, especially if a coat of paint be applied over it. You may be tempted to use a little mineral oil to cheapen with, but do not heed the painter who tells you that coal-oil will do no harm in paint.

Good browns may be made from black and ochre, or black and orange chrome yellow, with some Venetian red also. Yellow ochre and Indian red make a good color; also chrome yellow and Indian red. With ochre, black and Prussian blue you may make a rich bottle green. Bronze green is very often used, and may be made from orange yellow, drop black and a little burnt sienna. The most useful colors you will find to be ochre, black, burnt umber and Venetian red. With these, with white lead for a base, you may make almost any colors you will need to use.

* * *

Recent Work of Mr. Louis C. Mullgardt

Mr. Louis Christian Mullgardt, F. A. I. A., of San Francisco, is preparing plans for an elaborate country house for Mr. Herbert C. Hoover, America's food conservation specialist. The new Hoover home will be erected in the foothills near Palo Alto and in design will be what Mr. Mullgardt styles the American school. Fireproof material will be used, with an exterior of white cement and terra cotta tile roof. Mr. Mullgardt is also preparing working drawings for a beautiful marble and granite mausoleum for Mr. M. H. de Young, publisher of the Chronicle, and a $600,000 wholesale and office building to cover an entire block in Honolulu for the Theo. H. Davies Company, Limited.

Mr. Mullgardt's most recent work will be shown in the coming December number of The Architect and Engineer, including his sketches for improvements in the Yosemite Valley, the new business center for Honolulu, and the recently completed museum in Golden Gate Park.

Relative Cost of Different Types of Buildings

A STORY which originated in an eastern engineering publication showing the cost of an architect's design, compared with that of a structural engineer for the same building, to the disadvantage of the architect, has been going the rounds of the trade press. While the evident purpose of the story was to show the superior skill of the structural engineer in his particular field the comparison is made in a manner which does, unintentionally perhaps, an injustice to the architect, says Southwest Builder.

The building in question was a two-story commercial structure at Wilmington, Del. The architect's plans provided for a masonry building with steel columns and girders and wood floors. The cost fixed by bids taken was $34,521. The structural features of the building were redesigned by a structural engineer substituting reinforced concrete columns and floors for steel columns and girders with wood joists and floors and metal lath for wood lath. The cost of the building as determined by the structural engineer was $31,802, effecting a saving of $2719. The cost of the structural concrete was $6569, against $4759 for structural steel and $2600 for concrete and cement in the building as designed by the architect. In the building with reinforced concrete columns and floors there was a saving of $520 on lumber, $500 on carpentry labor and $1000 on brickwork and an addition of $102 for metal lath.

Whether the architect was given an opportunity to redesign the building with reinforced concrete structural features does not appear, nor do we assume if he had done so that he would not have employed an expert concrete engineer to perform the work. The engineering of a building such as was originally designed by the architect is a much simpler task than the engineering of a reinforced concrete structure. Few architects consider themselves sufficiently skilled in engineering to do the structural work on a reinforced concrete building without the assistance of an expert engineer.

But this is not to the real point. The relative cost of different types of buildings is not wholly a matter of engineering or design. The relative cost of materials and methods of construction is an important factor. The price of structural steel has advanced during the last three years out of all proportion to the advance in prices of other building materials. Whether the structural engineer could have saved anything in cost by re-engineering the structure with a steel interior frame and wood floors is an open question.

* * *

A parallel illustration of the facts developed regarding the Wilmington building can be cited in Los Angeles. Plans for a two-story brick commercial building with steel interior frame and wood floors were made by a Los Angeles architect about two months ago. The lowest bid on the building was $25,000. The architect redesigned the building, employing a structural engineer, and substituted reinforced concrete frame and floors for steel frame and wood floors and metal lath instead of wood lath. By this change the cost of the building was reduced $3000. There were special reasons for preferring the steel construction to reinforced concrete, but in view of the great difference in cost the architect recommended that the reinforced concrete design be accepted. The structural steel for this building alone would have cost at the market price in Los Angeles about $8000.

Reinforced concrete construction has been recognized for many years as the cheapest type of fireproof construction. It is cheaper today at current prices for steel than any type of steel frame construction. Architects generally understand the relative cost of construction thoroughly. Many considerations, however, enter into the type of construction desired for any building and usually the adaptability of a type of construction is given preference when it is not overshadowed by the element of cost.

Merits of a Wooden Shingle Roof*

By W. A. ROBINSON

IN discussing the "Merits of a Wooden Shingle Roof," I wish to call your attention not only to the many good points of a wooden shingle roof, but to refute certain charges made by manufacturers of competing materials and others, as to the fire hazard of same.

Wooden boards, or shingle, have been the universal covering for residences of this country from the time of the early settlers and until a better and cheaper material is found than now exists, will continue to be universally used.

The wooden shingles have absolutely no competitor in the roofing world from the standpoints of price and long life combined.

Most persons in making comparisons of the cost of other roofs with wood shingles use cost per square of other roofings against cost per 1,000 wooden shingles, which is misleading, inasmuch as 900 shingles laid 4½ inches to the weather will cover a square.

Practically every other roofing on the market requires the sheathing to be laid solid with dressed and matched boards, whereas shingle roofs are generally laid with 1x4-B" on centers requiring only 50 feet per square at $24 per thousand as against 120 feet of shiplap at $30 per thousand, $1.20 per square as against $3.60 per square for other roofings, or one-third as much.

There are no roofs on the market costing in the neighborhood of a wooden shingle roof on which the manufacturer of same will give a guarantee that it will last longer than 10 or 15 years, and then in most cases you are required to paint them every few years with a specially prepared coating of their own manufacture, whereas a roof of the best California redwood, or best Washington cedar shingles will last from 30 to 40 years and even longer, at a cost of not exceeding $8.00 per square, including shingles, sheathing and labor for applying both, as against approximately $10.00 to $12.00 per square for composition shingles or other like materials.

Therefore some of the advantages of a wooden shingle roof are:

Statistics prove lasting qualities greater than any other known roofing materials when applied to roof of proper pitch and with proper nails.

Past history basis of durability.

Not affected by cold in applying.

Easy and clean to apply.

Adapted to stains of any color.

Wood does not attract heat or cold.

Building cooler in warm weather and warmer in cold weather.

Looks best.

Lasts longest.

Made from a product provided by nature. Its qualities do not depend on proper mixtures and process of ingredients.

The wood shingles assure a satisfactory roof for ages.

The facts are substantiated by statistics confirming the reliability of the statement that the wooden shingle is the most durable, economical, comfortable and beautiful roof covering for residences known to exist today.

In regard to fire hazard, much of the anti-shingle agitation has been started after a conflagration has occurred in the congested residence districts of cities regardless of whether wooden shingles were a contributing

* Abstract of a paper read before the Shreveport (La.) Builders' and Material Men's Exchange

cause. It is perhaps unfortunate for the wooden shingle that it covers so long a percentage of our roof, thus making equal comparisons impossible. If conditions were reversed, there would be less opportunity and incentive to blame the shingle roof. Some of the worst conflagrations have been in the "fireproof district." The much advertised Atlanta, Ga., fire started in the business center, burned out to the residence section and was for granted attributed to the spread of shingle brands. This condition has been known to exist in many cases where the shingles have been blamed by the report "Sparks on Shingle Roof," which should have read "Defective Flue," or more properly "Defective building ordinance," or "Poor inspection."

Examination of a report of the State Fire Insurance Commission of Austin, Texas, dated February 14, 1917, indicates that had the chimneys been properly constructed and cleaned and building properly fire-stopped, the 1568 "unpreventable fires" attributed to sparks on roofs might have been reduced to a minimum or possibly listed under the column of "Preventable Fires."

In this connection I quote from a table in a bulletin recently published by the West Coast Lumbermen's Association, which compares a number of fires in frame and other buildings in 81 cities as follows:

"In this record of 25,829 fires scattered over the entire United States and involving all sorts of conditions, only 224, or less than nine-tenths of 1 per cent, extended beyond the adjoining buildings." Is this the evidence that warranted men in devoting their lives to eliminating the wood shingle?

To substantiate this I quote from a syllabus, published by the National Fire Protection Association, which says: It is the frequent conflagration in a business district where the commercial values are greatest (and where they might easily be guarded as above suggested) which makes the fire tax in the United States so enormous.

It is obvious from the above, and statistics show, notwithstanding statements to the contrary, that wooden shingles have contributed but a very small amount towards the spread of fire over larger areas, or elsewhere and it has never been proven that these same fires might not have spread had some other roof covering been used.

To eliminate the wooden shingles altogether would be a crime, for shingles have been, are and will continue to be the universal roof covering for smaller types of buildings, more particularly those of the residence sections outside congested districts. There are but very few cities in the United States where the use of the wooden shingle is specifically barred and nearly all of these are Southern cities, where the construction in the cheaper class of frame buildings is of a flimsy character and such buildings are generally crowded together in great numbers, with only enough room in some instances for a person to pass between them.

All of the cities of this country permit the use of wooden shingles within their corporate limits, outside the congested districts, which is proof that the advantages of wooden shingle roofs in residence districts are still recognized.

A few years ago the city of Houston passed a drastic anti-wooden shingle ordinance following a disastrous fire that wiped out several hundred small tenement houses as well as other classes of buildings.

The ordinance remained in effect nine months. During those nine months no wooden shingles were laid on roofs in the city of Houston. The

finer class of buildings are not hurt to any great extent by an anti-wooden shingle ordinance. It is the small home builder who feels the lash every time. He cannot put slate or tile on his roof for two reasons. First, it is very expensive for the roofing alone. Second, its weight is such that the construction of the building must be increased in strength, and likewise in cost, to provide for handling the heavy roof.

The supposed "wise men" who pass an anti-shingle ordinance, might do well to consider what the small home builder—who is the backbone of every city—is going to use in place of wooden shingles. If they would stop to think that when they say—"Thou shalt not use wood," they are actually saying to this man of small means, who would have a home of his own—"Thou and thy family shall roast under a metal roof"—for the small home builder has little of any choice. The only roof that compares with a shingle roof in price and weight is a tin roof, and to condemn a man and his family to live beneath one in this hot southern climate, is nothing short of crime.

Six or seven months after the passing of the Houston ordinance an investigation was started and its results were published at the time by the Houston Press.

This investigation disclosed the fact that during the nine months that the ordinance lived (it was unanimously repealed by the men who passed it) the building of small houses in the city of Houston had been retarded just 40 per cent as compared with the same nine months of the previous year—this in spite of the fact that several hundred small houses had been wiped out by fire that was the cause of the anti-shingle ordinance, the rebuilding of which would ordinarily have expected to put an exceptional number of building permits for small houses on the city records.

These small houses were rebuilt at once, as they were mostly rent houses and had been well covered by insurance, but that was all the small home building that was done in Houston during that nine months in the better class of residence districts, a condition of great building activity, in four to seven-room houses, changed under the anti-shingle ordinance to one of practical stagnation.

On the day that ordinance died, home building came to life in the city of Houston. On that day the Houston papers state that no less than 300 houses that had been held up awaiting the death of the ordinance began putting on wooden roofs.

If a city has reached a point where she no longer appreciates the building of homes; if she has arrived at that stage where she can afford to have her home building hopelessly retarded by foolish blue laws; if she is no longer in the race for supremacy with her neighbors; if she is ready to be called a "dead one" from a building standpoint; if she no longer believes that the welfare of the home builder is necessary to the welfare of the city—then—if that time has arrived—it may be true that an anti-wooden shingle ordinance will do no harm to her plans for the future.

But to beckon to the world with one hand pointing to the unrivaled facilities for future greatness we possess—and with the other hand hold back the home builder and home owner—is an opposite program that cannot work with success. The city that puts hurdles in the path of her building progress—that retards the building of homes—is handicapping herself sadly in her race for civic supremacy.

So much for the wooden shingle.

The Fourth California Conference on City Planning At Santa Rosa

By CHARLES H. CHENEY,
Architect and City Planner, Secretary of the Conference.

WITH the three most important State Commissions of California urging city planning as a basis for their work, the Fourth California Conference on City Planning and the convention of the League of California Municipalities, held at Santa Rosa, September 25 to 27, not only showed city planning progress but that this new science and art has come to stay.

Mr. Max Thelen, president of the State Railroad Commission, while warning the twenty-two City Planning Commissions of the State that changes and readjustments in transportation lines on future city plans must promote greater safety and convenience, stated that his commission had the complete power to order union depots, the joint use of tracks by two or more lines, and the elimination of grade crossings, with power to assess the costs to the railroads, the city or the county. He told of the complaint of the city of Los Angeles and several adjoining municipalities, now up for hearing before the Commission, in which a determination and order of a future railroad plan with joint use of tracks, union passenger and freight depots, etc., was submitted for permanent settlement. As transportation forms the backbone of any intelligent, permanent city plan, the importance to our cities of such an expression of co-operation as made by Mr. Thelen is very great. "Patriotism precludes the possibility that the Commission authorize any large expenditure now," he said. "However, now is the time to prepare for such changes, in carefully worked out plans for city development after the war."

THE IMPORTANCE OF ZONING

Zoning or districting of all cities as a war expedient, as an impetus to better business and in the interest of a broader and healthier community life, was urged by Mr. George L. Bell, secretary of the State Commission of Immigration and Housing. He said that planning commissions should be appointed in every one of the two hundred and thirty-nine cities and towns of the State and offered the co-operation of the State Housing Commission in formulating constructive zone ordinances. "Now is the time for us to go to work on this most important of all city problems. America is called upon to conserve her resources. The war requires us to think and act unselfishly now for the preservation of the State, and there will be less opposition now to community regulations than ever before.

"In France the commission for rebuilding the devastated cities is working out a careful zoning system as the sensible basis for reconstruction. That little war-torn nation is zoning every city. If France can do it in the midst of war, America can do it now.

"Better housing is possible only when permanency is assured. Housing of the right kind is more important even than the encouragement of medicine and surgery. Good housing is a preventive of bad health and suffering, while medical aid is, of course, only palliative."

ZONING A HELP TO BUSINESS

"However, I plead for zoning ordinances in all cities in the interest of better business. City planners will develop opposition, but it will be selfish opposition and unwarranted. Some may oppose you from ignorance; this is the class of people who opposed the State Railroad Commission and fought it so long. In New York city the realty men opposed the height

limitations of buildings. These same men told me on a recent visit that they were mistaken, that they had stood in the light of their own interests.

"It is the intention of the State Commission of Immigration and Housing to co-operate with every Planning Commission and to aid their members in a campaign of general education of the people. While we do not wish to become a court of review, we would suggest that all opposition from city officials and others be reported to the State Commission, that they may have the benefit of our advice."

Charles F. Stern, State Highway Commissioner, clearly pointed out the necessary co-operation between local City Planning Commissions which are formulating permanent city street plans, and the State Highway Commission, which is now completing the second installment of great trunk line roads through California out of the new $15,000,000 State bond issue passed last year. That the city should pay at least a part, if not half, the cost of paving main traffic streets, was a suggestion offered for serious consideration.

That zoning must be applied with caution, and only after making careful surveys of actual tendencies and conditions, was pointed out by Mr. Albert Lee Stephens, City Attorney of Los Angeles, whose carrying of the Los Angeles Zone Ordinance several times to the United States Supreme Court has resulted in decisions that are epoch-making for city planning in America. He said, "Whether or not this law (the new State Zoning Act), if all of its provisions shall be sustained, will benefit the small town, cannot be determined without the actual application thereof. It is my opinion that it will prove practical only in cities where natural development has impressed certain uses upon certain portions of the city to the practical exclusion of other uses. The city having in a way found itself may, by legislation, restrict the development along the lines already generally established, so that the character of improvements in one neighborhood may not intrude to the detriment, within the meaning of the police power, of the general character of improvements in another neighborhood.

"This is the principle underlying the Los Angeles zoning law, and in my opinion is the only principle upon which safe city planning can be based. I do not believe the Hadacheck case, which is the U. S. Supreme Court's legal approval of our law, is authority for the arbitrary districting of cities, as some have taken it to be.

"If the State zoning law is applied with judgment, it will be of inestimable benefit to California cities."

Actual demonstration of the use of the school as a social center was given the conference when it visited the Santa Rosa High School for an evening session and was shown the whole plant in operation for the use of the community, by T. P. Brownscombe, City Superintendent of Schools, who is responsible for a system now in operation in three large buildings of the city. With the aid of a live volunteer Citizens' Committee and a discerning and helpful County Probation Officer, Santa Rosa seems to have done what has been so long agitated but seldom put into practice in the cities of this country. Free moving pictures attended by twelve hundred children, followed by a program of folk dancing, and then public dancing, with a jazz band of Italians from another school (admission 5c. for six months' season), filled the Auditorium for the evening, while community singing for old folks, lectures, boy scouts' and campfire girls' meetings, classes in woodworking and domestic science, handball courts and free showers in the basement, all seemed well attended by adults and children alike.

Other interesting addresses, provoking very live discussion, were made by Mr. George A. Damon of Pasadena, Professor J. W. Gregg of the University of California, Mr. J. J. Jessup of Berkeley, Mr. W. J. Locke of San Francisco, Mr. Mark C. Cohn of San Francisco, Mr. Frank D. Stringham of Berkeley, Mr. Miles O. Humphreys of Fresno, and Mr. G. G. Whitnall of Los Angeles.

The Conference elected the following officers for 1918: President, Mr. Thomas H. Reed, City Manager of San Jose; vice-president, Mr. Albert Lee Stephens, City Attorney, Los Angeles; vice-president, Mr. Miles O. Humphreys, President City Planning Commission, Fresno; secretary-treasurer, Mr. Charles H. Cheney, Architect and City Planner, San Francisco.

Executive Committee: Mr. Mark C. Cohn, San Francisco; Mr. George A. Damon, Pasadena; Mr. Oscar Ford, Riverside; Mr. L. A. Handley, Los Angeles; Mr. A. F. Heuer, Alameda; Mr. W. J. Locke, San Francisco; Mr. A. S. Lavinson, Oakland; Mr. J. C. Merriam, Berkeley; Mr. Chester H. Rowell, Fresno; Mr. C. F. Stern, San Francisco; Judge Matt I. Sullivan, San Francisco; Mr. G. G. Whitnall, Los Angeles; Mr. F. C. Wheeler, Los Angeles.

CITY OFFICIALS CONVENE

Cities throughout the State were well represented at the convention of the League of California Municipalities. Many matters of interest to governing bodies of cities and towns were discussed and papers were read by various engineers and city officials.

The subjects of better city government and efficiency in the handling of municipal affairs seemed to be given more attention than in former years, when contracts and disbursements were more a matter of political reward than of civic betterment.

Methods of sewerage disposal were discussed at length by Mr. R. V. Orbison, City Engineer of Pasadena, and a paper on water purification was read by Mr. Chas. G. Hyde. The benefit of municipal ownership was a subject of much discussion and a description of the new municipal baths at Lodi, by City Engineer L. F. Barxellotti of Lodi was received with great interest by the delegates.

Mr. Charles T. Phillips, consulting engineer of San Francisco, gave a talk on Scientific Street Lighting, which seemed to be a subject in which most of the delegates present showed considerable enthusiasm. Mr. Phillips said in part that success in street lighting could be obtained only by a detailed analysis of local conditions and a consideration of the various items that enter into the installation. A mere consideration of the source of light would not obtain efficiency in the operation cost, nor would the selection of a system which some other city had adopted necessarily obtain satisfactory results. Cities that were using the latter method would soon become aware of their mistake and that they had overlooked details which would entail loss of money to their municipality. The operating cost, maintenance, financing, electroliers, lamps, distribution of light, different systems of underground and overhead conductors for supplying current and rates for electrical energy were gone into in detail.

The Convention lasted six days and was attended by over three hundred delegates and several hundred visitors. The following officers were elected for 1917-1918: President, Mr. Lorin A. Handley, Los Angeles; vice-president, Mr. M. D. Gray, Jr., Fort Bragg; 2nd vice-president, Mr. Wm. P. Butcher, Santa Barbara; secretary, Mr. H. A. Mason, San Francisco; executive secretary, Mr. W. J. Locke, San Francisco.

Next year the California Conference on City Planning and League of California Municipalities will meet at Riverside, probably in the first week of October.

Condition of Structural Steel in a Building After Seven and One-Half Years' Life

SOME interesting conclusions on the condition of steel work in a building demolished after a life of only seven or eight years are given in the last annual report of the Bureau of Buildings of New York City. The information relates to the Hoffman House and Albemarle Hotel, which were removed to make place for a high commercial building.

The old building was located on the northwesterly corner of Broadway and Twenty-fourth street, New York City, and consisted of a seven-story and cellar non-fireproof structure. Adjoining and surrounding the same was a twelve-story fireproof building used in connection with the hotel. This latter structure occupied an L-shaped lot with frontage on both Broadway and West Twenty-fourth street. Records in the bureau show construction was commenced October, 1906, and completed in December, 1907. In July, 1915, a permit was issued for the demolition of the building, making in all seven and one-half years as the extreme age of the structure.

The walls were of the skeleton type, 12 inches thick for the uppermost 75 feet of height and thence increased 4 inches in thickness for each lower 60 feet or fraction thereof. For floors 9 and 10-inch terra cotta flat arches sprung between steel beams were used, with the usual 2-inch cinder fill between the sleepers and a double wood flooring. The partition walls throughout the building were of terra cotta blocks plastered on both sides. All interior columns were encased in 2-inch terra cotta block, while the customary 4 and 8-inch of brickwork was used for exterior and wall columns.

The foundation consisted of concrete piers in open caissons carried down to rock at a depth of about 37 feet below curb. It appears that during the construction of the foundation considerable ground water was encountered, necessitating the use of steel sheet piling. A great deal of this sheeting was uncovered, especially where it interfered with the new work. The sheeting for the most part was intact and showed very little corrosion. In fact, in many places the smooth, even surface of the black iron was plainly visible. Whether the absence of rust was due to the comparatively short period that the sheeting was in place (a little over seven years) or whether it was due to the drawing away of the ground water by the new subway construction, is hard to say. Evidently both contributed toward the preservation of the metal. Along the northerly wall a number of timber piles were uncovered. Their age is unknown, but the action of rot due to the absence of water was remarkably illustrated. On some of the piles the entire mass had rotted away except the heart wood.

At the time of the erection of the twelve-story building it was found necessary to underpin the west wall of the old Hoffman House. This was done with steel cylinders driven in 5-foot lengths to rock and filled with concrete. These piles, however, showed practically no rust.

Throughout the entire structure the absence of any cases of severe rusting of the steel work was apparent. The steel appeared to have been given originally two coats of paint, and in most cases the coating was intact without the slightest sign of corrosion. Practically the only places where rusting did take place was the outer face of the exterior columns in the easterly court wall. This wall was exposed for almost its entire height to weathering conditions. In all probability the 8 inches

of brick encasing the outer face of the column would have been sufficient to protect the steel from moisture but for the fact that the outside 4 inches of the wall was face brick. The unfilled space between the face brick and the backing appears to have aided the collection of moisture and also to have retained it. At and near connections the conditions were worst, but in no case sufficient to impair the strength of the metal.

At the outer faces of a wall column on the Broadway front on the seventh floor, rust formation could be readily noticed on the outer channel and plate. These sides were protected from the weather by brickwork and ashar facing, but apparently water was able to percolate through the joints and attack the steel. The coating of paint had already peeled off in some places, but the corrosion had not progressed to a point where the strength of the steel might be considered impaired. The fact that these columns had already begun to show signs of rust at the age of only seven years would tend to prove that more protection is necessary for wall columns than the customary coating of paint.

The inner faces of wall columns were all in very good condition and did not show signs of corrosion.

The faces of inner columns were smooth and even, with not the slightest sign of rust on their surfaces. The coating of paint was unscarred.

In the case of steel sheet piling, where the metal came in contact with the soil, corrosion could be readily noticed, but not to an extent sufficient to impair the strength of the steel.

The examination indicated that the exterior wall girders and the outside faces of the wall columns seem to be the vulnerable points for corrosion in the steel work of skeleton buildings.

* * *

What Can Be Done to Restrict the Use of the Title Engineer?

ONE of our readers has sent us a newspaper clipping headed: "Engineers Likely Will Lose Jobs." The "engineers" referred to are marine enginemen. Our reader pertinently asks why these men should be called engineers.

In England the old word "engineman" is used to designate those who operate engines. But in America it became the early practice to call enginemen engineers. In the absence of organized societies of engineers no adequate protest was made against the usurpation of this professional title by mechanics; so now it will be no easy matter to effect a change. Nevertheless, we believe that engineers should use their individual as well as their collective energy to bring about a restriction of the word "engineer" to those who are professionally entitled to it.

We suggest that our readers can individually aid in this plan by never failing to write to the editor of a daily paper in which enginemen are spoken of as engineers, asking the editor to assist in maintaining the original titular distinction between these two classes of men.

We also suggest that societies of railway engineers should try to persuade railway officials to drop the use of the word engineer as a designation of locomotive drivers. The Brotherhood of Locomotive Engineers might object to an attempt to change their title, but it is likely that even they would not insist upon retaining a name that leads to confusion. Certainly many of them have already ceased automatically to be "locomotive engineers" and have become "motormen" on "electric locomotives."

One of the desirable—though perhaps not immediate—results that will flow from the passage of state laws licensing engineers will be restrictions placed upon the use of engineering titles. To our way of thinking, this result would alone justify the passage of licensing laws.

In writing articles and books it has long been the practice of the editor never to apply the word engineer to an engineman. Similar care on the part of other engineers will aid in restoring the ancient and reasonable distinction between these two names.—Engineering and Contracting.

* * *

Speaking of Building

Two friends met at a lunch counter.

"I understand," said the man who ordered hot cakes, "that there is to be lots of building this spring."

"Yes," said the man who ordered coffee and sinkers, "but you are now talking to a person who is not going to do much of it."

"Why not?"

"Well, let me give you a bit of my own experience."

"Well—"

"The other day I hired a man to saw a door through a wall in my upstairs—"

"Uh huh."

"And when he had finished that I asked him to cut a window in another place."

"I see."

"And when he had finished I asked him for his bill."

"What did he charge?"

"Well, for the two chores he taxed me exactly $38."

"Whee!"

"You know I intended to build a house."

"Yes."

"And, taking those figures as a basis, what do you think it would cost?"

"Can't imagine."

"Well, I figured that a six-room house with sleeping porch and finished attic would stand me just $9,000,068."—Exchange.

* * *

France May Use Our Terra Cotta

Manufacturing of building material in France is virtually paralyzed from the lack of labor, or diversion of labor to more war-like things. Therefore that country must look elsewhere for its brick, terra cotta, cement and specialties. The United States has already begun to supply the Frenchmen's needs. A large shipment of bricks was made last week, and it is undoubtedly the forerunner of shipments of other building products.

Architectural terra cotta should make an especial appeal to the French esthetic taste, and the American manufacturer may find this a big field. But outside of its architectural possibilities, terra cotta will permit France to rebuild not only quickly but permanently.—Exchange.

* * *

Pigs in the Clover

"That was a great feat of Subbubs, to catch that burglar in his home."

"Oh, I don't know. Subbubs planned his house himself, and the burglar couldn't find his way out."

BUILDING FOR THE H. N. COOK BELTING COMPANY, SAN FRANCISCO
WARD & BLOHME, ARCHITECTS

DETAIL OF FACADE, BUILDING FOR H. N. COOK BELTING COMPANY
WARD & BLOHME, ARCHITECTS

THE
Architect and Engineer
OF CALIFORNIA

Founded in 1905 by E. M. C. WHITNEY

A. I. WHITNEY - - - *Manager*
T. C. KIERULFF - - - *Legal Points*
FREDERICK W. JONES - - *Editor*

Published Monthly in the Interests of the Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast by the Architect and Engineer.

BUSINESS OFFICE AND EDITORIAL ROOMS
627-629 Foxcroft Building, San Francisco
Telephone Douglas 1828

The publishers disclaim any responsibility for statements made in the advertisements of this magazine.

TERMS OF SUBSCRIPTION
(Including postage) to all parts of the United States $1.50 per annum; to Canada 50c additional; to all Foreign points $1 additional.

VOL. LI. OCTOBER, 1917 No. 1.

ASSOCIATE EDITORS

WM. B. GESTER. - *Inspection and Tests*
O. P. SHELLEY, C. E. } *Fireproof Construction*
F. W. FITZPATRICK. }
W. W. BREITE, C. E. - *Structural Steel*
ATHOL MCBEAN } *Brick, Tile and Terra*
W. E. DENNISON } *Cotta*
HOWARD FROST. }
H. M. LOWENTHAL - *Roofs and Roofing*
FRED'K N. WOODS, JR., - *Rock and Gravel*
WILBUR DAVID COOK. *Landscape Architecture*
PAUL C. BUTTE - *Electrical Construction*
LOUIS G. MAUER - - *Waterproofing*
CHAS. H. CHENEY - } *City Planning and Book Reviews*
W. H. GEORGE - - *Reinforced Concrete*
T. R. BURKE - - *Sanitary Engineering*
J. W. FRICKE.. .. .. .. *School Equipment*

ARCHITECTURAL

Alfred F. Rosenheim — Edward M. Garden
Fred H. Meyer — Irving F. Morrow
August G. Headman — F. D. Hudson
Horace G. Simpson — Elmer Grey
G. Albert Lansburgh — Sumner P. Hunt
Herman Barth — Ernest Coxhead
Chas. S. Kaiser — Harrison Albright
Chas. Peter Weeks — John Parkinson
Octavius Morgan — A. W. Smith
J. C. Austin — William H. Weeks
John J. Donovan — Chas. W Dickey
W. H. Ratcliff, Jr. — Jas. W. Plachek

CONTRIBUTORS

Kenneth MacDonald, Jr. — Nathaniel Blaisdell
Wm. L. Woollett — Willis Polk
Wm. Arthur Newman — Smith O'Brien
Wm. C. Hayes — C. H. White
John Bakewell, Jr. — B. J. S. Cahill
Clarence R. Ward — T. Paterson Ross
John Galen Howard — Alfred Kuhn
Louis C. Mullgardt — John Reid, Jr.
W. Garden Mitchell — Arthur Brown, Jr.

THE BUILDING SITUATION

Said a noted English lecturer the other day in regard to business in England: "The business firms which 'kept everlastingly at it' gained prestige which they have profited by ever since. They soon found that their policy was more than justified; for instead of 'business as usual' it became 'business unusual.' And America will find it just the same. In weeks, rather than months, you will get a great reaction and business will enjoy greater prosperity than has ever been known in your history."

And that's exactly the situation we're going to have in this country. Building is feeling it already.

Still there are some people who talk about waiting to build until "normal" times and prices are restored. If such people don't need their buildings for four or five years, well and good; but they must not fondly hope for such restoration in less time. We hear talk about things being on a more stable basis in four or five months. Utterly farcical. Even if war stops tomorrow, it will take two years to disband the European armies, while meantime, and for long afterward, there will be demands upon us for machinery, materials, even food, equal to those of the present. And at the same time our stocks have been depleted and running low, so that our own wants must be met. And those wants are not modest. Money coming into the country and prosperous times here will make those wants many.

Even when normal times are restored, it will be a new normality. Never again will building prices be where they were two or three years ago, any more than will beef ever be as cheap as it was when vast herds of cattle roamed the free pastures of the West.

Our natural products are more rare, harder to get; our manufactured ones more costly to produce. It is a new era. Besides, with as

much gold as has come into the country, a new standard of values is established. When a commodity is abundant it is cheap; when money is plentiful, it buys less; and there you are.

No, if a man needs a building at all, there is absolutely no sense in waiting. Now is the time to build!

FIREPROOF SCHOOLS

An engineer in authority in the South is responsible for the statement that the school board in one of our larger cities is about to let the contract for a slow-burning school building when it is possible to secure a reliable firm to erect a fireproof building of the same size and under the same general specifications for less money—actually less—than the slow-burning structure calls for.

It is said, further, that the argument which seems to control the school board in its decision is that the architect submitting plans for an absolutely fireproof structure beggared his building by putting too much fireproof into the construction. The slow-burning building is planned to be more ornate, and on this account alone stands the best chance of securing adoption.

Such action by this particular school board on the grounds here set forth would be reprehensible in the extreme, remarks the Southern Architect and Building News. It is the business of the school board to study the specifications of the building and learn without outside intervention whether the fireproof building, as planned, will be "beggared" or not.

Beauty of construction is, of course, a consideration that has great weight, but when a lot of useless ornamentation is placed in the balance against fireproof construction, the decision should be so prompt that architects would not again have the temerity to argue in favor of a slow-burning building.

There are times when slow-burning construction is the most desirable for economic reasons or for expedience, but the construction of a school is not a case of this kind. In school buildings of the country fireproof construction should be the preliminary consideration.

AN APOLOGY TO MR. DONOVAN

Mr. John J. Donovan, former City Architect for the city of Oakland, feels he has been injured by the publication in the September Architect and Engineer of a personal letter to the editor of this magazine in which the architect stated that a certain brand of maple flooring used in a number of Oakland school buildings and installed during his administration, had given satisfaction. Mr. Donovan declares that in all his practice he has discreetly refrained from publishing any endorsement whatsoever of any manufacturer's article and in printing his letter he feels this magazine has taken unfair advantage of his confidence. Mr. Donovan feels that such advertising endorsement cheapens and belittles its author, besides being contrary to the ethics of the profession.

The Architect and Engineer regrets exceedingly having placed Mr. Donovan in a questionable light and had the editor been aware of the architect's strong sentiments against manufacturer's endorsements he most assuredly would have refrained from publishing the letter in question. This magazine has always had and still maintains a very warm regard for the Oakland architect, whose high standing in the architectural profession cannot be questioned.

No Institute Meeting This Year

The American Institute of Architects has decided not to hold its usual convention this year on account of the war. Many members have joined the colors, while others report business so uncertain that they do not feel in a position to attend the convention with its accompanying expenses.

Ship Plant Means New Industrial Center

Mr. John T. Scott, general superintendent of the new Pacific Coast Shipbuilding Company, has returned from a tour of the North Pacific Coast, during which he studied shipbuilding plants with a view to making the yards to be constructed on Suisun Bay the most modern on the coast.

He is enthusiastic over the outlook for the $5,000,000 company in which he will continue the long shipbuilding career in which he has been identified with the Union Iron Works and the Moore and Scott Company. The president of the new corporation is Mr. Henry T. Scott, who, for twenty years, was head of the Union Iron Works.

Work on the Suisun Bay site is to be started at once and the construction of the plant which is to have a minimum capacity of 100,000 tons every three years, will be rushed.

It is expected that the shipyard will be ready for work of steel vessels by the first of the year.

According to Mr. Scott, there is ample room at the Pacific Coast Company's site for one of the most elaborate plants, and it has been determined that the 2800-foot deep water frontage can be materially increased as needed.

A big force of workmen will be required for the erection of the ways, machine shops, foundry and other buildings, and the construction of the slips and docks. The project involves the establishment of an industrial center which, in the opinion of Mr. Scott and others, is to become one of the largest in the West.

Immediately on the completion of the plant, it is announced, the government stands ready to give the company orders that will keep it running at capacity for six years.

American Institute of Architects

(ORGANIZED 1857)

OFFICERS FOR 1916-17

PRESIDENT.....JOHN LAWRENCE MAURAN, St. Louis
FIRST VICE-PRESIDENT.....C. GRANT LA FARGE, New York
SECOND VICE-PRESIDENT....W. R. B. WILLCOX, Seattle, Wash.
SECRETARY....W. STANLEY PARKER, Boston, Mass.
TREASURER.....D. EVERETT WAID, New York

San Francisco Chapter

PRESIDENT.....EDGAR A. MATHEWS
VICE-PRESIDENT.....SYLVAIN SCHNAITTACHER
SECRETARY AND TREASURER.....MORRIS BRUCE
TRUSTEES.....W. B. FAVILLE, G. A. WRIGHT

Southern California Chapter

PRESIDENT.....J. E. ALLISON
VICE-PRESIDENT.....J. J. BACKUS
SECRETARY.....A. R. WALKER
TREASURER.....AUGUST WACKERBARTH

Board of Directors

ROBT. D. FARQUHAR, PERCY A. EISEN, S. B. MARSTON

Portland, Ore., Chapter

PRESIDENT.....JOSEPH JACOBERGER
VICE-PRESIDENT.....J. A. FOUILHOUX
SECRETARY.....W. C. KNIGHTON
TREASURER.....FOLGER JOHNSON
TRUSTEES.....ION LEWIS, M. H. WHITEHOUSE

Washington State Chapter

PRESIDENT.....CHARLES H. BEBB, Seattle
1ST VICE-PRES....DANIEL R. HUNTINGTON, Seattle
2D VICE-PRESIDENT.....GEORGE GOVE, Tacoma
3D VICE-PRESIDENT.....L. L. RANO, Spokane
SECRETARY.....JOSEPH S. COTE, Seattle
TREASURER.....ELLSWORTH STOREY, Seattle
COUNCIL.....JAMES STEPHEN, Seattle; JAMES H. SCHACK, Seattle; CHARLES H. ALDEN, Seattle

California State Board of Architecture

NORTHERN DISTRICT.

PRESIDENT.....EDGAR A. MATHEWS
SECRETARY-TREASURER.....SYLVAIN SCHNAITTACHER

Members

JOHN BAKEWELL, JR. J. CATHER NEWSOM

SOUTHERN DISTRICT.

PRESIDENT.....JOHN P. KREMPEL
SECRETARY-TREASURER.....FRED H. ROEHRIG
MEMBERS.....OCTAVIUS MORGAN, SUMNER P. HUNT, WM. S. HEBBARD

San Francisco Architectural Club

OFFICERS FOR 1917

PRESIDENT.....CHAS. PETER WEEKS
VICE-PRESIDENT.....A. WILLIAMS
SECRETARY.....JOHN F. BEUTTLER
TREASURER.....WILLIAM HELM

San Francisco Society of Architects

PRESIDENT.....GEORGE W. KELHAM
VICE-PRESIDENT.....JOHN REID, JR.
SECRETARY-TREASURER.....WARREN CHARLES PERRY
DIRECTOR (1).....CHARLES PETER WEEKS
DIRECTOR (2).....ARTHUR BROWN, JR.

Engineers and Architects Association of Los Angeles

PRESIDENT.....A. H. KOEBIG, SR.
FIRST VICE-PRESIDENT.....A. S. BENT
SECOND VICE-PRESIDENT.....IRA J. FRANCIS

Directors

J. J. BACKUS, GEO. P. ROBINSON, ALBERT C. MARTIN, H. L. SMITH

Washington State Society of Architects

PRESIDENT.....A. WARREN GOULD
SECRETARY.....WM. J. JONES
TREASURER.....J. L. MCCAULEY
TRUSTEES.....HARRY H. JAMES, WM. J. JONES, ALFRED BREITUNG, J. L. MCCAULEY, G. F. ROWE

San Diego Architectural Association

PRESIDENT.....CHARLES CRESSEY
VICE-PRESIDENT.....W. TEMPLETON JOHNSON
SECRETARY.....ROBT. HALLEY, JR.
TREASURER.....G. A. HAUSSEN

San Joaquin Valley Ass'n of Architects

PRESIDENT.....W. J. WRIGHT
VICE-PRESIDENT.....E. B. BROWN
SECRETARY-TREASURER.....FRANK V. MAYO

With the Architects

Building Reports and Personal Mention of Interest to the Profession

Personal

The firm of Graham, Burnham & Company, which succeeded that of D. H. Burnham & Company, upon the death of Mr. D. H. Burnham, has been dissolved. As a result of the dissolution, after forty-four years of continuous work which included the designing of many of the most important buildings in Chicago and other cities as well, Messrs. Hubert Burnham and Daniel H. Burnham, Jr., withdraw and will continue the practice of architecture in the Rookery building, Chicago, under the firm name of D. H. Burnham & Company.

Mr. William Wilde, who is preparing plans for the new Bank of Canton to be erected at Montgomery and Sacramento streets, San Francisco, has moved from the Maskey building to the Nevada Bank building. He has the suite of offices formerly occupied by Mr. Sidney B. Newsom, who recently enlisted for service in France.

Mr. Burnham Hoyt, architect, connected with the office of Mr. Bertram G. Goodhue, has been awarded the $150 first prize offered by the Art Alliance of America for a design to advertise the second Liberty Bond issue.

Messrs. John K. Branner and Albert Cauldwell, with offices in the Clunie building, San Francisco, have joined the United States Engineers Reserve Corps for service with Uncle Sam.

The partnership between Messrs. Norman F. Marsh and Herbert C. Howard, architects of Los Angeles, has been dissolved by mutual consent. Mr. Marsh will continue in business at 211 Broadway Central building. Mr. Howard has not announced his plans.

Two Million Dollar Plants

Two exceptionally large industrial plants for the interior of California are being planned by Messrs. MacDonald & Kahn, constructing engineers, with offices in the Rialto building, San Francisco.

At Fresno the California Raisin Growers' Association will spend $1,000,000 in building reinforced concrete curing and packing houses, while at Stockton another million dollars is to be expended on a paper mill. Plans for both factories are being prepared by the San Francisco engineers.

A Call to Service

Practically every institution in the country which trains professional men has signed the call to those young men who are under military age, and to those who are unable for other reasons, to serve their country in the Army or Navy, to consider the equally patriotic services in the field of applied science. Here architecture will play an important part both now, and when the war is over. Every architectural school in the country should be filled to its capacity with young men fitting themselves for this service to their country.

R. CLIPSTON STURGIS,
Chairman,
Committee on Education,
American Institute of Architects.

Granite Mausoleum

Mr. Edward T. Foulkes, Crocker building, San Francisco, is preparing plans for a concrete and granite mausoleum to be built in Cypress Lawn Cemetery, San Francisco, for Mr. Henry W. Ohlandt. The estimated cost is $15,000. Mr. Foulkes is also architect for extensive alterations to the Tribune building, at 13th and Franklin streets, Oakland.

Oakland Garage

Messrs. Reed & Corlett, Oakland Bank of Savings building, have prepared plans for a one-story Class C garage and sales department for Mr. Walter Arnstein. The building is being built by segregated contracts on the southeast corner of 21st and Webster streets, and when completed will be occupied by the Willard Battery Company.

Addition to Building

Mr. J. R. Miller, Lick building, San Francisco, has completed plans and taken bids for a two-story reinforced concrete addition to the two-story Class C store and loft building on Mission street, between Fourth and Fifth streets, San Francisco, owned by Dr. J. V. Black.

Nominated for President

San Francisco Chapter, A. I. A., has nominated Mr. John Bakewell, Jr., and Mr. Edgar A. Mathews for president. The election will take place at the next meeting of the chapter.

Los Angeles Chapter Elects Officers

Los Angeles Chapter, A. I. A., has elected the following officers for the ensuing year: President, Mr. J. J. Backus, chief inspector of buildings for the city of Los Angeles; vice-president, Mr. H. M. Patterson; secretary, Mr. Henry F. Withey; treasurer, Mr. August Wackerbarth; director, Mr. Lyman Farwell.

Following the dinner, a very interesting talk on experiences at the battle front in France was given by Mr. Norman Smith. Mr. Smith has recently returned from France, where he served with the American Ambulance Corps which has been doing service since the outbreak of hostilities.

At the business session of the meeting, action was taken by the Chapter remitting all dues or assessments for members who may be absent in the service of the country. Mr. John T. Vawter was appointed to assist the war department in recommending recruits and disseminating information in regard to the Camouflage units which are being organized to serve with the American army. These units will be organized as companies of engineers. The age limit for recruits is from 18 to 40 years. The men will enlist as privates and receive such promotion and advancement as their ability warrants.

Unique Candy Shop and Tea Room

Mr. Alfred Kuhn has let contracts for a new candy shop and tea room in the one-story building No. 171 O'Farrell street, San Francisco, for Mr. James N. Hunnicutt. The entire building will be remodeled and a new front constructed, which will be of artificial stone and tile. The interior will be handsomely fitted with enamel woodwork, ornamental plaster and decorated throughout; many novel features will be provided.

In the rear of tea room will be the kitchen and candy making department, which will be thoroughly modern and sanitary in every detail. The entire improvements will cost $20,000.

Our Architecture from the Clouds

Rufus Steele, the author recently enjoyed his first ride in an aeroplane. In describing the impressions of his flight over San Francisco Mr. Steele had the following to say of interest to the architectural profession:

How glorious is nature when one is up where he can grasp her vast color scheme. Always nature is expressing herself in curves. Only man craft insanely insists on square corners and straight lines.

From the sky the buildings do not fade into the ground as the hills do; they stand out. Poor Nature can neither understand nor absorb the geometrical artificialities of man. If only the first architects could have flown up to where they could get the comparison, what wonderful curved-line structures we would be living in and doing business in today!

Maybe we will take hold of the architects when we have won the war. The present business is to get that supreme army of aviators ready for the battle front.

Union Iron Works Machine Shop

Bids have been opened for the construction of a Class "A" machine shop for the Union Iron Works at Alameda. W. C. Duncan & Co., Sharon Bldg., San Francisco, is understood to have submitted the low bid. The building is to have steel frame, the steel having been fabricated in the East by the Bethlehem Steel Company and is now arriving. The pile driving has been practically finished by the Healy-Tibbitts Company. This building is to be the largest of its kind on the Pacific Coast, covering a ground area 550 x 165 feet and 80 ft. high. The first floor is to be covered with redwood blocks, something new for basement floors, and which are said to be giving splendid satisfaction.

Flat Buildings for Stockton

Mr. R. P. Morrell, I. O. O. F. building, Stockton, has prepared plans for altering the residence of Mr. J. M. Ladd into two modern six-room flats. Mr. Morrell also has plans for altering the residence of Mr. H. J. McPhee in Stockton into four modern flats.

Mr. Morrell is preparing working drawings for a two-story frame residence to be built in Yosemite Terrace, Stockton, for G. E. Bartholemew.

Los Angeles Hotel

Messrs. D. A. and M. A. Hamburger and W. H. Clune are contemplating the erection of a Class "A" hotel building on the northeast corner of Broadway and Ninth street, Los Angeles, the building to be leased to a syndicate of San Francisco capitalists interested in the Palace Hotel of that city. The site has a frontage of 248 feet on Broadway and 160 feet on Ninth street. Preliminary plans provide for a 12-story structure of steel, brick and reinforced concrete with terra cotta facing. The cost will be about $1,500,000.

Factory Plans Finished

Miss Grace Jewett, 939 Jones street, San Francisco, has completed plans for a factory building to be erected in Oakland for the American Machine Works. Mr. A. A. Wise is owner of both property and the machine works. Building will be on the north side of Fourth street, 125 feet west of Washington street, on a lot 50x100 feet, and will cost about $30,000.

Plans Finished for Mausoleum

Mr. T. Paterson Ross, 310 California street, San Francisco, has completed plans and specifications for the large mausoleum to be erected at Forest Lawn Memorial Park, Tropico. Construction is to be of concrete, granite, marble and bronze, and the estimated cost is $250,000.

Designing Large Apartment House

Mr. Ralph P. Morrell, I. O. O. F. building, Stockton, is preparing plans for a three-story and basement store and apartment house, 86x140 feet, to be erected in Modesto. Construction will be frame and plaster. There will be 20 apartments and four stores. Building will be equipped with wall beds, steam heat, hardwood floors and all modern conveniences.

Large Hotel for Chico

Chico is to have a tourist hotel to cost $125,000. Mr. Woodworth Wethered is the architect and the project is being financed by the United Holding Company, Inc., 837 Mission street, San Francisco. The new hotel will be constructed of concrete and will contain about 60 rooms and baths.

Additions to Byron Hot Springs.

Messrs. Reid Bros., California Pacific building, San Francisco, have prepared plans for a women's dormitory to be built at Byron Hot Springs. It will be concrete. They have also made plans for a one-story stone or brick "Spa," to be built at Byron Hot Springs in memory of Mrs. Louis R. Mead.

Sacramento Warehouse

Plans have been completed by Mr. Washington J. Miller of San Francisco for a two-story and basement reinforced concrete warehouse for Libby, McNeil & Libby, to be erected on the company's property in Sacramento. An estimate of $100,000 is placed on the cost of the improvement.

Women's Club Houses

Messrs. Bliss & Faville of San Francisco are preparing plans for a club house for the Women's Club of Sausalito.

Mr. Chas. H. Young of Stockton has drawn plans for a club house for the Women's Improvement Club of Escalon, San Joaquin county.

Competition for Richmond Library

Miss Della Wilsey, city librarian of Richmond, is arranging for a competition by architects for plans for a $15,000 addition to the Carnegie Library. The winner's sketches will be adopted and sent to Mr. Carnegie for final approval.

Yacht Club Building

Mr. John Graham, Green building, Seattle, Wash., is preparing plans for a club house for the Seattle Yacht Club. It will be a two-story brick and half timber structure and the cost is estimated at $40,000.

Military Roads

The following resolutions were adopted by acclamation at the War Convention of the Chamber of Commerce of the United States, held in Atlantic City in September:

Whereas, It is essential that all transportation facilities of the nation should be brought to the highest state of efficiency in order that foodstuffs may be moved most economically from the farm to the market, that manufactured products be moved at the lowest cost from the factory to the consumer;

Whereas, The public highways offer a good, prompt and economical means to supplement transportation by rail and water;

Therefore be it resolved, That the prompt improvement of our public highways is important and should be forwarded in every proper way.

Change Fresno School Plans

The Fresno Board of Education has instructed Messrs. Coates & Traver, Rowell building, to use brick instead of wood and plaster in the construction of the new Kirk school, for which plans are being prepared. The building is to contain fourteen classrooms and will cost approximately $45,000.

Plans for Oakland Residence

Mr. Claude Barton, First Trust building, Oakland, has completed working drawings for a $10,000 two-story frame and plaster residence and garage to be erected in the Crocker Tract, Piedmont, for Attorney Abe P. Leach, Security Bank building, Oakland.

Designing New School

Messrs. Wm. Mooser and Albert Schroepfer are designing two of the proposed new school houses recently authorized by the Colma school district. A third school is being designed by Mr. Henry C. Smith, San Francisco.

Addition to San Rafael High School

The board of education, city of San Rafael, has awarded a contract for the construction of a two-story frame addition to the high school building, from plans by Mr. Thomas O'Connor. The building will contain a domestic science and manual training department.

Addition to Bakery

The Langendorf Baking Company Inc., has had plans prepared by Mr. Nathaniel Blaisdell, 251 California street, San Francisco, for a one-story and basement brick addition to its bakery on the south side of Golden Gate avenue, east of Fillmore, San Francisco, 55x137½ ft

Auto Sales Building

Mr. G. V. Applegarth, Claus Spreckels building, San Francisco, has prepared plans for a one-story and basement brick auto sales building, 30x129 feet, for Mr. Redmond, to be erected on the north side of Eddy street and Van Ness avenue, San Francisco. Estimated cost, $10,000.

To Report on State Building

The committee appointed by the San Francisco Board of Supervisors to report on the Bliss & Faville plans for the new State building, has held a conference with the Governor, and Mr. Arthur Brown is preparing a report which probably will be made public in due course of time. In the meantime the matter of taking bids for construction of the proposed building has been indefinitely put over.

Three Alameda Bungalows

Mr. Reed Baxter, 3419 Broadway, Oakland, has completed plans for three bungalows on Gould Court, near Lincoln avenue, Alameda. They will be frame construction with cement plaster and rustic exterior, composition and crushed brick roof, oak floors, water heaters, etc.

Large Concrete Warehouse

Mr. F. A. Knowles of the Raymond Granite Company is building a reinforced concrete warehouse at 9th and Brannan streets, San Francisco, from plans by Mr. Wm. H. Crim, Jr. The building will cost approximately $35,000.

$10,000 Stockton Residence

Mr. Chester H. Miller, First Trust building, Oakland, has completed plans for a $10,000 two-story frame and plaster residence to be built at Stockton for Mr. E. Allen Test of that city.

Spring Mansion to Be Private School

The $100,000 Spring mansion, above Thousand Oaks, Berkeley, has been purchased by Miss Cora L. Williams, 2401 Channing Way, Berkeley, and the house is to be altered and equipped for a private school.

Oakland Factory to Be Doubled

The General Electric Company is to duplicate its Mazda Lamp Division plant on Sixteenth street, Oakland. A four-story building, 65x190 feet, costing $100,000, is planned.

Contract for Apartments

Mr. Theodore W. Lenzen, Humboldt Bank building, San Francisco, has let a contract to remodel a three-story frame building at 1267-69 Eddy street into six modern apartments.

Commercial Garage

A $50,000 reinforced concrete garage for Mr. William Garland has been designed by Mr. L. A. Smith, architect, with offices at 621 Investment building, Los Angeles.

Stucco Specifications

The publishers of The Architect and Engineer of California have received many favorable comments of Mr. John B. Orr's paper on "Artistic Stucco," which was printed in the May number. Among the letters received is one from Mr. John M. Mahon, Jr., assistant engineer, Department of Health, Harrisburg, Pa., who asks to be enlightened concerning Mr. Orr's specifications for finish coat of stucco. Mr. Orr is invited to answer through the medium of this magazine:

I shall appreciate your kindness very much if you will advise me relative to your specification published on page 90 of the latest issue of The Architect and Engineer of California. In connection with the finish coat of stucco you specify 15 per cent of hydrated lime as part of the mixture. Am I correct in assuming that this amount refers to a percentage of the total mix rather than of the cement and sand and that it is by weight and not bulk? I find that there seems to be no unanimous understanding among contractors as to just what this method of specifying hydrated lime means, although it is very general. Although the variation through a misunderstanding of this item might be slight, in such matters I have found that it is the best to adhere strictly to successful specifications when possible, and I, therefore, take the liberty of making this inquiry before filing this specification for future reference.

Thanking you in advance for your courtesy, I am,

Very truly yours,
JOHN M. MAHON, JR.,
Assistant Engineer.

Cost of Cantonments to Date

Major W. A. Starrett, expert adviser in the building of the sixteen cantonments for the draft armies, states that the government has expended $150,000,000 on this work in three months. More than 4,000 miles of finished road surface, 2,000 miles of water pipe, 2,000 miles of sewers and 4,000,000,000 ft. B. M. of lumber were involved in this work. At each of the sixteen camps there were employed 8,000 to 10,000 men. On one job the contractor held a foreman's meeting every morning, at which as many as 500 foremen were present. The government had 150 representatives in each camp.

Mr. Starrett states that in addition to the gigantic cantonment construction the government has $350,000,000 worth of buildings in progress or contemplation.

$150,000 Fresno Building

It is stated that the new building that Judge Frank Short is to build in Fresno from plans by Mr. Kenneth MacDonald, Holbrook building, San Francisco, will be erected on percentage by Messrs. Palmer & Petersen of San Francisco. The structure is to occupy ground area 125x150 feet, and the two stories to be erected now will be sufficiently heavy to carry from six to ten additional floors later on. Construction will be of reinforced concrete, cantilever type, to permit of an unobstructed view of the show windows. The building will cost approximately $150,000.

The Contractor

HIS TRIALS, TRIBULATIONS AND TRIUMPHS

How to Handle Sub-contracts

By A. BLAIR*

IT would be ideal if all sub-contracts could be handled by the contractor, just as the government handles their lettings: simply awarding the contract to the lowest bidder who properly qualifies.

In many such instances the government loses by the transaction; not always in real dollars and cents paid out for actual construction, but in many indirect ways, such as months' delay in the completion of the building resulting in expense for additional rent, and for salary of government superintendent, much more labor and trouble in the office of the department, unsatisfactory results that have to be accepted in the end.

Why is it that the contractor cannot strictly apply this same method in placing his sub-contracts? Because, if he expects to make his contract a profitable one, or at any rate expects to prevent loss on his contract, his work must go along systematically, his material must be delivered at the proper time, and the work must be accomplished at the proper stage; all the bond in the world will never enable the contractor to progress with his brickwork, for instance, if the brick have not been delivered; and, if there is such a delay, the direct and indirect expense to the contractor is incalculable.

It is human nature to place a sub-contract with the lowest bidder, and thereby save apparently a goodly sum of money, but how often have we each found that this course sometimes results in a loss of more than we expected to gain. It is such risks as these that justify the contractor in undertaking, so far as practicable, to develop mechanics in all the various branches of work, placing in the hands of his foreman the responsibility for the expeditious, economical, and satisfactory execution of the work.

Primarily the argument for a general contractor would be based upon his ability to get branches of his work executed properly, economically, and satisfactorily. Why should a contractor who places the responsibility on his foreman for employing bricklayers and getting brick laid, and carpenters to install the woodwork, find it necessary to make a sub-contract to have the painting done, and to what extent and when is a contractor justified in carrying this plan into further branches of his work?

What does he gain by sub-letting such work? The certainty of what it is going to cost, the freedom from detail, the assurance of getting skilled men—all these are good arguments, but what will such a course cost him? and in how many instances is he assured that in the final wind-up he will have secured any or all of these benefits?

Where a contractor goes into a territory that is foreign to him he feels that there is an advantage in placing this responsibility on others who will be more familiar with local conditions, but his lack of familiarity with local conditions carries with it also a lack of knowledge as to who to trust in placing such sub-contracts; and such a lack of knowledge may prove his undoing.

Under what circumstances can a general contractor ordinarily afford to place sub-contracts of this kind? One way would be by having developed sub-contractors who will go from place to place and who, by experience, he will have found able and willing to work as hard as he does and shoulder their responsibility and make good.

In the selection of a manufacturer of material the contractor may go far wrong in selecting the lowest quotation. What is he to do? He can hardly afford to say, "I will never buy from a new man," because the supply of experienced manufacturers would thereby some day be exhausted if that rule were followed generally. It is suggested that he should decline to accept quotations radically below others received, or radically below his judgment of the reasonable amount; he should protect himself in every reasonable way, and he should make special effort to co-operate with the material man, that the probability of errors may be reduced as much as possible.

What has the manufacturer a right to expect from the contractor? Full and complete data, prompt reply to all communications; explicit and plain information; careful handling of material at the building, prompt statement of damage to shipments, or the discovery of errors in

*A paper read before Association of Government Contractors.

work; very prompt and explicit statement of any charge that the contractor may make against him, these statements being supported by proper vouchers, freight bills, or otherwise, to show clearly why such charges are made. Full and prompt compliance with the terms of agreement as to payments. How often we hear the expression that the contractor does business on the money of the material man or sub-contractor.

What has the contractor a right to expect from the manufacturers and from the sub-contractor? Prompt handling of all correspondence; prompt and complete furnishing of the required shop drawings and samples; cheerful acquiescence in the reasonable demands of the superintendent appointed to interpret the specifications; a realization that he, the material man, has undertaken to comply in behalf of the contractor, with all the terms and conditions of the general contract, so far as they relate to his particular part of it.

The contractor has a right to expect from the manufacturer prompt delivery of materials at the time and in the order in which they are needed.

It is entirely possible to arrive at an ideal condition in respect to the transactions between contractor and manufacturer or sub-contractor. There is a legal maxim still quoted in the courts, "Caveat emptor" (let the buyer beware), but surely it must not be a case of "Caveat emptor" between contractor and manufacturer or sub-contractor, but of honest, intelligent co-operation.

The Fight Against Fire*

By FRANKLIN H. WENTWORTH,
Secretary National Fire Protective Association.

THE European peoples point to the fire waste of America as evidence that the American people are the most careless and irresponsible individuals in the civilized world. This is not a flattering tribute. It behooves us to inquire if the charge be true, and if so, how we may mend our unpleasant reputation. Statistics show that in the United States and Canada the fire waste is roughly ten times as much per person as in Europe. This contrast is partly explained by the facts that there are more people in Europe upon whom to figure this percentage and that more buildings in America are constructed of wood. Outside of Constantinople with its insanitary conditions, European cities are seldom visited by such sweeping fires as have devastated the American cities of Chicago, Boston, San Francisco, Atlanta, Baltimore, Chelsea, Salem, Paris (Tex.), Nashville, Augusta, and others. American building construction is inferior to that of Europe in other respects. A poorly built city with numerous wooden buildings awaits only the right kind of a fire on the right kind of a night for its complete destruction.

Of the personal hardships, individual sufferings and economic disasters which follow the burning of a city, too many American cities can testify. The economic significance of these fires is not confined, however, to the cities that burn. Every fire, whether it consumes a whole city or only the roof or other portion of an individual house, has to be paid for. A burned house or city does not replace itself. Food, clothing and shelter are produced only by human effort; and labor expended in replacing waste is withdrawn from producing more things for the satisfaction of human needs. Hence, every fire makes every man's struggle for a living harder, by compelling him to spend for his neighbor's waste what he might otherwise spend for his own comfort.

Our annual waste of $3 per capita means that every man, woman and child pays $3 a year for fire waste. That means that the man with the average family, a wife and three children—a family of five—pays $15 a year fire tax. The United States Government in its reports adds to this fire waste the cost of maintaining fire departments, which is as much more. This means $30 a year to the average family. If on some blue Monday in every year a representative of the Government were to come around and ask each of us for a $30 check to pay our share of the national carelessness, then we would realize what we pay. But we do not realize that we pay it, because this tax is indirect.

Big manufacturers and big merchants know that this fire expense is a tax. They equip their premises with automatic sprinklers. They put in protective apparatus. They get the lowest insurance rate they can because it helps them to compete; but the man in the street—the ordinary man—does not know how this fire waste is paid. Take wool, for example. Wool in the warehouse is insured—that is a tax. It is insured in transportation, and there it pays a fire tax. It is insured in the textile factory where it is worked up into cloth. It is insured in the clothing store, insured in the tailor shop, in the department store, and all the way along this fire tax is added to the cost; and when we buy a coat, we pay it. Every stock of goods that is insured carries this tax, and it is passed along to the ultimate consumer. The masses do not know that they pay it. They do not realize that when they buy a hat, or a pair of shoes, or a suit of clothes, or anything which goes through the regular channels of industry—production, distribution and exchange—they pay this tax. Not realizing it, they are indifferent to fire. They think fire does not affect them.

The fire loss in the United States and Canada for the last ten years has averaged $230,000,000 a year. What might we not

*Address delivered before the Fall meeting of the Portland Cement Association, Chicago.

do with that? We might build roads, canals, improve our harbors, build battleships—if we have no less medieval use for our money. We could do a great many things with $230,000,000 a year. What country can stand a drain like that? Suppose we were to throw into the sea $230,000,000 in wheat or corn or cotton, or lose $230,000,000 out of our national treasury. Then we would realize that we are being impoverished by this waste. But we have lost the faculty of being moved by an ordinary fire. In Europe a $100,000 fire shocks the entire continent. All the papers in Continental Europe comment on it, wanting to know how it occurred, who was responsible for it, whether the conditions obtaining in the city where it occurred can be found elsewhere, so that such a fire might not be duplicated. But here in America, if we take up the morning paper and do not find reports of two or three $100,000 fires we think it has been a dull evening!

We are the most careless people with matches on the face of the earth. Matches are everywhere; on our bureaus, in our desk drawers, on the mantel-pieces, library tables, in all our old waistcoat pockets in the closets. If we wake up in the middle of the night and reach out and cannot find a match we feel insulted! And yet every match is a potential conflagration. Fire from a single match may burn a whole city.

The fire waste touches the pocket of every man, woman and child in the nation; it strikes as surely but as quietly as indirect taxation; it merges with the cost of everything we eat and drink and wear. The profligate burning every year of $230,000,000 in the value of work of men's hands means the inevitable impoverishment of the people. This fearful loss, spread over the entire business world of America, is beginning to manifest its impoverishing blight.

It is the ever-present conflagration hazard which makes any approach to scientific fire underwriting impossible. The conflagration hazard is not confined to any one city or state. It is present in every city and state in the Union. We have built largely of wood, and sooner or later we must pay the penalty unless we can find some way in which to protect our cities.

There is a way to solve this conflagration problem—not absolutely, but at least relatively. We cannot be expected to tear down our cities and rebuild them of fire-resisting material; the cities must be protected as they stand. In the heart of nearly every city there are streets crossing at right angles, along which for a very considerable distance are buildings of brick, stone and concrete. This shows a more or less complete Maltese cross of buildings which are not wood and which operate to divide the wooden-built district into quarter sections, and which might hold a fire in any one of these sections if they were equipped to do so. These brick and stone buildings are ordinarily valueless as firestops, because their windows are of thin glass and their window frames of wood. At Baltimore and San Francisco the conflagration attacked such buildings easily, breaking out the panes, consuming the frames, and converting every story of these brick structures into horizontal flues full of combustible contents. Brick and stone buildings are logical and capable firestops if the fire can be kept out of them. The small city that will trace out its Maltese cross of such buildings and equip them with metal window frames and wired glass will immediately possess the equivalent of substantial fire walls crossing at right angles in its center, dividing it into four sections. By such a simple, inexpensive, but yet strategic procedure, many a city may save itself from the destruction which now awaits only the right kind of a fire on the right kind of a night.

I have referred in this plan merely to the smaller cities, but it is obvious that this form of protection is equally imperative in the brick, stone and concrete districts of all large cities where great values are housed in close proximity. Fires in the large cities entail an enormous waste because of the great values assembled there. We must come eventually to the equipment of all commercial, factory and office buildings with metal window frames and wired glass. This will mean the abolition of the conflagration hazard in our cities. Fires will then be unit fires, extinguished easily by a competent fire department within the building in which they originate; for the protection of window openings not only prevents fire from entering, but prevents fire from issuing out of the burning building. We may expect an occasional exceedingly hot fire to break down the defense of an adjoining building, but it is obvious that a conflagration could not get under way among buildings of fire-resistive construction with properly protected window openings.

Having thus fortified city buildings one against the other, extensive fires within individual structures can be prevented by the use of the now well-established automatic sprinkler system. The automatic sprinkler applies the water without the help of human agencies while the fire is still incipient. It will operate in a dense smoke as well as in a clear atmosphere. It will not throw excessive deluges of water in wrong places as the fire departments are continually forced to do. With our window openings protected and our buildings equipped with such extinguishers, the conflagration hazard in mercantile districts will be eliminated. There will then remain for consideration our immense residence districts constructed almost wholly of wood surrounding the mercantile centers, like fagots around a funeral pyre. We can lessen the loss here by the abolition of the use of wooden shingles.

Electrical Department

The Telephone and Telegraph in War Times*

THE singing wires that carried to the American people the news that they were officially at war with Prussianism were ready at that moment to step forward and accept the full consequences of their message.

Last February the gangs worked twenty-three out of twenty-four hours in order to put Washington on enough wires to keep the world from getting the busy signal when it called. They did not get it all done then, but it helped the March gangs who slowed down to twenty hours. Long line wires out of Washington increased from 149 to 300, two hundred more are now being installed. Long distance operators were increased over the country to the number of 12,000 and more are in training. Whereas one circuit on the transcontinental line between Chicago and San Francisco has heretofore handled all existing commercial business, two additional circuits for the complete distance are being constructed.

A comprehensive system of exclusive telephone and telegraph service is being installed for the use of the Army, Navy and other departments. This will release for commercial uses some of the 10,000 miles of equipment which have had to be taken for the Government use. The headquarters of all the naval districts, and the army camps and headquarters and all other necessary points are in touch with Washington by almost perfect wire connections.

But the greatest task is just beginning. The mobilization camps to be established immediately must be thoroughly equipped with every wire facility. Sixteen cantonments each containing 40,000 men will spring into existence within a few weeks. Six hundred and fifty thousand men will require telephone and telegraph service both for official and personal purposes. In an average city of 40,000 souls not every citizen expects every-day messages of an emergency character, but these are to be cities of our men who are going to war. There must be no mistakes, no delays, no difficulties for them. Washington must be on all of the sixteen wires all of the time.

In this instance, as in every other enterprise today, it's the men we are going to lose that make the thing loom big. We have been so used to putting large forces to work on colossal jobs and hurrying them to completion. Money did not count. It was the men. But

* Abstract of an article in The Nation's Business by Mr. H. M. Baily, showing how wire and wireless companies have met the task of fitting the country to handle war messages.

Wybro

Reg. U. S. Pat. Office

The Panels that are as good as they are famous.

244 Varieties of Wybro Quality Panels

If it's a **different kind** of a panel you require, you will find it among the WYBRO family of 244 varieties.

WYBRO PANELS come in all woods and sizes. Each variety is fully as good and worthy of the name.

Whatever "kind" of a panel you need is listed in our Wybro catalogue, which is free to you for the asking.

White Brothers 5th and Brannan Sts. San Francisco

DON'T WAIT — OR LOSE TIME HUNTING
Get the Man You Want Instantly. USE THE

"National Calling System"
THE INSTANT MAN FINDER

WESTERN REPRESENTATIVES:
Sierra Electric Construction Company
619 CALL BUILDING, SAN FRANCISCO Phone Sutter 2297

HIGH GRADE
ELECTRICAL CONSTRUCTION WORK
FOR BUILDINGS

BUTTE ENGINEERING AND ELECTRIC CO., 683-87 Howard Street,
SAN FRANCISCO, CAL.

PACIFIC FIRE EXTINGUISHER CO.
ENGINEERS AND CONTRACTORS

Heating and Ventilating, Electrical Installations, Fire Extinguishing Apparatus

THE GRINNELL AUTOMATIC SPRINKLER
Main Office. 507 MONTGOMERY STREET, SAN FRANCISCO, CAL.

Branch Offices:
217-218 Colman Building - - - - - - - - - Seattle Wash.
504-505 McKay Building - - - - - - - - - Portland, Ore.
826 Paulsen Building - - - - - - - - - - Spokane, Wash.
563 I. W. Hellman Building - - - - - - - Los Angeles, Cal.

Ask the Architect-He Knows

where you can get good and suitable lighting fixtures for your new building. He is interested in having the lighting brighten (not deaden) the effects he has sought to accomplish in his architectural design. He will, doubtless, advise you to go to ROBERTS MFG. COMPANY, 663 Mission Street, San Francisco, where you will find the largest stock to select from, all at equitable prices.

GET ACQUAINTED WITH THE

"Bay States." He's puritanical to a fault and only displays himself on goods of PROVEN quality. Brick and cement coating is his hobby and it's just as good on interior walls, as years of service on exteriors HAVE proven.

Wadsworth, Howland & Co., Inc.

BOSTON, MASS.

DISTRIBUTING AGENTS:

JAMES HAMBLY & SONS,
268 Market Street, San Francisco, and
447-449 East Third Street, Los Angeles

J. B. Winstanley & Co., - - - Portland, Ore.
F. T. Crowe & Co., - - - - - - Seattle, Wash.
Jones-Moore Paint House, - - San Diego, Cal.

now the large forces are not going to be available. The problem is to get greater projects through in less time with fewer men.

Ten per cent of the wire companies' employees between the ages of 20 and 31 are already in the service of their country. Three thousand Morse operators are ready for the Signal Division. Four battalions of officers and men, trained under Brigadier General Squiers, are members of the Signal Corps. Not only the trained experts but the construction and wire gangs are depleted.

Regiments of girls are in training to take the places of those who are to go in the offices, but they have not yet taken to training for stringing wires. Telephone and telegraph schools are in session all of the time, excepting Sundays. The girls undergo a physical and mental test. Most of them seem to feel the seriousness of the situation rather more than the average busy citizen. It brings it home to you to have to fill the empty chairs.

Most of the girls in the telegraph schools are learning to manipulate the wonderful new automatic telegraph device which has been installed in stations all over the country. It has greatly facilitated the training of new operatives. It is not necessary to know the Morse code. A good typist can run the machine providing her nerves are strong and her powers of endurance sufficient.

All wires of communication—like their political namesakes—lead to Washington. From every corner of the civilized world calls are coming in continuously.

It is a dramatic feature. Requests of harassed governments, desires of dying dynasties, the urge of defenseless people, tales of victory and defeat, the plight of the wounded and the plaint of the hungry all hammering at the heart of the nation over multitudinous tiny copper wires.

The telegraph, telephone, cable and wireless, creeping upon us gradually, have suddenly made us international. Commercial co-operation has quadrupled through prompt information; vast investment increases have been assured by hour-to-hour intelligence; a world has become joined to us by the bond of common knowledge. We did not appreciate the hold upon us until we found it no longer possible to shut from our ears the cries of the nation's friends and live unto ourselves. The world's business had become our own. We could not talk to it of its troubles and take no part in them. Our boundaries and responsibilities have come to be limited only by the reach of our messages.

When the severing of diplomatic relations with Germany became a fact, the Council of National Defense said:

"With regard to the utilization of the telephone and telegraph systems of the

To Be "Low Bidder" Not Always Our Aim.

Our most particular attention is given to prompt and skillful handling of all electrical work of any nature with "QUALITY AND SERVICE GUARANTEED."

Our nation-wide organization and large experience in this field assures you always of fair estimates and absolute satisfaction.

F. E. NEWBERY ELECTRIC CO.

163 Sutter St. (413 Lick Bldg.) San Francisco, Phone Sutter 521

ASBESTOS PROTECTED METAL FOR ROOFING AND SIDING

For permanent industrial buildings of all classes.
Economical — Low maintenance.
Permanent without paint under the most severe conditions of service.

ASBESTOS PROTECTED METAL CO. Ask for Bulletin.

First National Bank Bldg., PITTSBURGH San Francisco Office, Hobart Bldg.

C. JORGENSEN & CO.

BUILDING MATERIALS

Phone Kearny 2386 20 Crossley Building, SAN FRANCISCO

LUXFER
SIDEWALK LIGHTS
TRANSOM PRISMS

TOCH BROS.
"LIQUID KONKERIT"
"TOXEMENT"

JAS. P. DWAN, Hearst Bldg., San Francisco Phone Douglas 3199

DESIGNERS OF FIXTURES

GOOLD & JOHNS

ELECTRICAL CONTRACTORS AND ENGINEERS

Phone 1-1-1-1 113 S. California St., STOCKTON, CAL.

San Francisco, Cal. Oakland, Cal. Los Angeles, Cal.

NEPAGE, McKENNY CO.

Electrical Engineers and Contractors

Phone Sutter 2369 149 New Montgomery St., San Francisco, Cal.

H. W. Fincke Geo. C. Derby

IDEAL HEATING & ENGINEERING CO.

FAN SYSTEMS FOR HEATING AND COOLING

General Sheet Metal Work Warm Air Furnaces
Ideal Air Washers Blow Pipe Systems

PHONE MARKET 3708 192 ERIE STREET, SAN FRANCISCO

CITY OF PARIS

Decorative Studios

GEARY AND STOCKTON STS. SAN FRANCISCO

country for the government's needs, the vital thing fully realized by both the federal officers and the wire companies has been to perfect a co-ordination to secure complete co-operation not only between the Government and the companies but between the companies themselves with regard to communications and censorship of communications."

This is the first time in the history of warfare that methods of immediate intelligence have played so vital a part. It is the first time a nation has been able to bring to its aid so vast a perfected system of intelligence transmission as is today under the control of American capital. Following the statement from the Council of National Defense, officials from the wire companies and the Government went into conference. The result was inevitable. The nerves of the nation joined up to the one spinal column and prepared to perfect itself to furnish to the Government head and heart the nervous force for the waging of the gigantic struggle before it. The telegraph-telephone-cable wireless is now an integral part of our fighting strength.

Scarcely one hundred years ago it took fifty-two days for news of the Treaty of Ghent to reach the men behind the guns. During those seven weeks there was continuous fighting about Mobile and the Battle of New Orleans, with its needless loss of life, had been decided before the news arrived that peace existed. Today it takes less than five minutes to send a message from the war room at the White House to London.

The world was a long time awakening to the fact that Morse had something to offer that was vital and revolutionary. He was a dreamer and his art appealed to the public far more than his alphabet. Not until 1842 could he secure sufficient funds to enable him to test out his telegraph. Then Congress let him have $30,000 for a line from Baltimore to Washington. Twenty years later there were 150,000 miles of wire over which the Morse code was singing.

Deep interest in the transmission of immediate intelligence had not, however, even at the time of the Civil War, taken a great hold upon the world's imagination. It was looked upon as a business luxury or as an emergency necessity. Not all of us have yet forgotten the early terror at the sight of the yellow envelope. The grizzled veterans of the Indian warfare found the telegraph their chiefest friend, but during the Civil War Congress was patently inimical to the Signal Corps. Nevertheless, the idea had gained ground. If it were possible to send electrified messages across the earth, there must be some way of getting them over the seas.

The first congratulatory message sent across Cyrus Field's submarine cable in 1868 was from the President of the United States to the Queen of England. It said in part:

"All civilized nations should declare spontaneously that the electric telegraph shall be forever neutral; that the messages entrusted to it shall be regarded as secret even in the midst of hostilities." How little did they foresee the vital grip upon the pursuits and passions of mankind this world wonder was to gain.

About forty-five years ago Alexander Graham Bell, teaching deaf mutes to talk, wanted to make a phonautograph. He got a dead man's ear. From experiments with that and a portion of gold-beater's skin stretched over a drumhead with a small piece of metal glued in the center, we got our telephone. Three years later he was greatly cast down because the Western Union Telegraph Company declined to pay him $100,000 for all his rights in what is the greatest single patent ever issued. The first commercial telephone company was established that same year.

Since 1902 the telephone has increased in this country over 100 per cent. In one rural section alone, within a thirty-mile radius of Chicago, 18,000 farmers now have wire service. In a medical report from the Middle West it has been estimated that insanity among women in formerly isolated districts on the great prairies had decreased 25 per cent since the universal advent of the telephone. If the cable made "the hands across the sea" an actuality, and the telegraph eliminated time and terminated suspense, the telephone has brought to us the electrifying, courage-producing human contact which those appreciate who have heard the "touch shoulder, men," under fire.

What the telephone has done for the social and the business world it is now doing for the war world. It has been contended that victory is to the bank account. A mere "measure of value"

WALL PAPER ✤ Uhl Bros.
PHONE KEARNY 255 38 O'Farrell Street, San Francisco

never yet won a great moral conflict. The force of honorable purpose, the massed strength of human intelligence backed by the perfection of electrical thought transmission is a power that is not computable in dollars and cents.

Europe has laid aside its peace wire service almost entirely. Its telephone, telegraph and cable service is confined almost entirely to government matters and field service. Censorship is so strict in England and France that no telephonic communication is permitted saving in English in the former country and in French in the latter, and even then someone "listens in."

Fortunately our going to war set the wires tingling. Wire business went to the nth power and planned to go beyond. And it's a pace that we've got to keep up. There can be no resting on the job until the war is over. Government messages have, of course, been given precedence over all others, but commerce and industry have had no discouragements. The Navy took over the strict censorship of the cable and the army that of the telegraph, but so far only messages to Mexico have been subjected to supervision, and one can talk over the telephone in any language that will be understood at the other end.

It is taking some wire and more construction and an immense amount of inventive ability to overcome all of the difficulties in the way of furnishing all the communicative powers required by the country in a few months.

On the great battlefields of Europe methods of immediate communication have been "doing their bit." Modern warfare has become so much a matter of machine guns, deadly gases and scientific means of wholesale slaughter, that it has developed a necessity in the fighting man for cunning as well as courage. Heroism there is in great quantities, but it is attuned to present-day exigencies.

War could hardly be carried on now without the telegraph, telephone, wireless, cable and the buzzer system. Wireless is used from the General to the Brigade Headquarters, but cable is used from there to Battalion Headquarters, and along the trenches. Within the trenches the cable wire is strung along the side, hung on pegs.

It is the cable detachment that has the opportunity for showing heroism. The cable must be laid beneath the ground four inches or so in order to prevent its being trampled upon and broken. It is not difficult for a detachment of ten men, eight horses and a wagon to be discovered by the enemy. Most of the work has to be done under fire.

At Mons, Captain Corcoran tells us, a cable detachment went out to repair a unit that had been disabled. A German airplane discovered it and promptly blew it to pieces. A second wagon took its place and shared the same fate. There was no hesitation, however, and a third, expecting nothing better, went out to the task—and escaped by a miracle. That is about the percentage. One out of three.

Then there is the story of the hero of Givenchy. The men in the trenches were from three to four hundred yards from support. A wooden peg, invisible even to the airmen, marked the spot where the telephone wires connecting them with headquarters were bunched about a foot below the surface. Just about dawn a shell from the enemy's guns struck the earth near to the peg and destroyed the junction box. In a second a soldier-miner set out to repair the damage.

Rifle in hand and his appliances in his knapsack, he crept the two hundred yards around a traverse and dropped into a shell hole. The Germans discovered him and kept up a heavy fire. The man worked until he had finished, apparently unharmed. The first word that went over the wire told of the massing of the Germans for attack directly in front of them. There was no time for reinforcements, but they made their

O'HARA & LIVERMORE
Designers of
INTERIOR DECORATION
IN ALL ITS BRANCHES
- STUDIOS AT -
322 Sutter Street
SAN FRANCISCO, CAL.
Tel. Sutter 284
251 E. Colorado Street
PASADENA, CAL.
Fair Oaks 2175

Master Builders Method

Master Builders Method — with Master Builders Concrete Hardner — is standard practice the world over for the construction of concrete floors that are Dustproof, Wearproof and Waterproof. More than 21,000 satisfied users. Over 80,000,000 sq. ft. in every-day use. Makes the ideal type of floor for all buildings where floor service is essential and the elimination of dust is necessary. Send for our "Primer"—a complete text book on the subject of better concrete floors. Sent FREE, without obligation.

THE MASTER BUILDERS COMPANY

Makers of Master Builders Concrete Hardner; Master Builders Red Concrete Hardner; Master Builders Black Concrete Hardner; Roadyte Concrete Hardner for Concrete Roads; Saniseal Liquid Concrete Hardner.

Main Office and Works: CLEVELAND, OHIO.

AGENTS

Colvin & Hoskins
Spokane, Wash.
Raymond C. Grant
Helena, Mont.
Sam Hunter Co.
Seattle, Wash.
F. S. Cook & Co.
Portland, Ore.
C. Roman Co.
San Francisco, Cal.
A. E. Banks,
Los Angeles, Cal.
S. A. Roberts & Co.
Salt Lake City, Utah

stand. The Givenchy fight is bloody history.

The telephone hero was among the missing.

"Keep Business Going" Campaign

The Society for Electrical Development recently mailed to more than 20,000 persons a broadside circular announcing its "Keep Business Going" campaign. The circular contains, among other things, an important letter to the industry signed by Henry L. Doherty, president of the Society. It suggests that in view of the greatly widened market for electric service in many fields, it is time to lay aside petty jealousies in the industry and concentrate on building business.

The possibilities of electric power to replace steam power, of electric light to protect bridges, munition plants, water ways and work shops, of electrical appliances to lighten the labor of the home and on the farm, were, according to the circular, never so great as at this moment.

The Society urges the sales side of the industry not to let down in its efforts, but to seek out new possibilities of serving the public. It suggests that many power consuming devices, which formerly might have been thought to be luxuries, are now certainly proved to be necessities.

The key-note of the new campaign is that business must be kept going if the banks, merchants, lighting companies and other commercial interests are to contribute their share to the national defense.

Exhaust Fan for Kitchen

One of the most useful applications of an electric motor about the household is the small motor-driven exhaust fan for the kitchen. Every one appreciates the need of a ventilating system for the kitchen. Any attempt to ventilate this room by opening the windows and doors is bound to fail, especially in the winter time. Many tradesmen who do electrical wiring are therefore in a position to extend their service to customers with profit.

Without the ventilator the odors from cooking will penetrate the entire house and linger in the rooms long after the meal itself is gone. The motor-driven exhaust fan consists, as the name suggests, of a small motor attached to a powerful fan. The device is mounted in an upper pane of a window, near the range, and well toward the top of the room. The motor is attached to the lighting circuit, and provided with a suitable snap switch for starting and stopping it. During the operation of the cooking the switch is turned and the fan forces out a steady stream of air, carrying with it all smoke, gases and odors.

DO YOU USE ANY HIGH GRADE

CABINET or HARDWOODS?

WE MAKE A SPECIALTY OF THEM

PRIMAVERA, MAHOGANY, KOA, JENISERO, OAK, ASH, ETC.

DIECKMANN HARDWOOD CO.

Beach and Taylor Streets, SAN FRANCISCO

ROBERT W. HUNT JNO. J. CONE JAS. C. HALLSTED D. W. McNAUGHER

ROBERT W. HUNT & CO., ENGINEERS

BUREAU OF INSPECTION TESTS AND CONSULTATION

251 KEARNY ST., SAN FRANCISCO

NEW YORK LONDON CHICAGO PITTSBURGH ST. LOUIS SEATTLE TORONTO MEXICO CITY

CEMENT INSPECTION

INSPECTION OF STRUCTURAL AND REINFORCING STEEL

REPORTS AND ESTIMATES ON PROPERTIES AND PROCESSES

CHEMICAL AND PHYSICAL TESTING LABORATORIES

How One Big Firm is Serving Its Country

An example of what the "Stay-at-Homes" may accomplish for their country in these days of strife, is found in the offer of Robert W. Hunt & Company, well known engineers, to lend its services at actual cost and the acceptance of same by the United States government authorities. Following is a copy of a letter addressed to the Secretary of War and Secretary of the Navy as early as last April:

To the Honorable
The Secretary of Navy,
Washington, D. C.

Sir:—

We have the honor to herewith offer to your Department the services of our organization on terms which will mean their being rendered to the government at their actual cost. This we do as a patriotic duty, because we believe that with our large and efficient organization, and of its peculiar character, we can be of service to the country in a particularly practical manner, and at a cost to the country of much less than equivalent services could be otherwise obtained.

Our organization has been in existence for nearly thirty years, and has grown in size and efficiency based upon its actual operations. It now embraces about 700 people, consisting of experienced civil, mechanical, metallurgical, chemical and mining engineers, supported by a corps of subordinates, most of whom are also men of technical and practical education, and the others selected on account of their practical experience in the several lines of duty to which they are assigned.

While our principal office and laboratories are situated in Chicago, we have branch offices and laboratories in New York City, Pittsburgh, St. Louis, San Francisco, Montreal, Canada and London, England, each of them under the personal charge either of a member of our firm or trusted subordinates.

Our corps of inspectors are practically permanently stationed at the principal manufacturing plants of both this country and Canada, and are in personal charge of the orders which are being executed for our many clients, and when we state that our monthly expenditures for salaries, etc., closely approximate $100,000, it will give you an idea of the extent and value of our service. We append hereto a list of the principal organizations constituting our clients, and embracing marine, railway and other industrial organizations, and from that number we would specifically name the Union Pacific, Southern Pacific, Oregon Short Line, Oregon Washington R. R. & Navigation Co., St. Joseph & Grand Island, Pacific Electric, Arizona Eastern, Morgans Louisiana & Texas, Galveston, Houston & San Antonio, Texas & New Orleans, Houston & Texas Central, Houston East and West Texas, Northwestern Pacific, Peninsular Railway, Stockton Electric and Canadian Pacific Ry. Cos., because for their organizations we are inspecting practically everything of all characters purchased by them, including equipment as well as materials. In the case of the Union Pacific and Southern Pacific and their allied lines, it possesses peculiar significance from the fact that in July, 1912, their officials abolished a large and complete inspection staff and equipment of their own and placed the entire matter in our hands. That it has continued for almost five years is the best indication of the, to them, satisfactory character of the arrangement, and we can with confidence refer you to Mr. Julius Kruttschnitt, Chairman of the Southern Pacific, in this matter. We name him because he is a member of the Operating Committee on Railroads of the National Defense Board, lately organized.

In regard to our work for the Canadian Pacific Ry. Co., we can refer you to Lord Shaughnessy, President of that Company, who has been and is, as you know, so closely identified with the Canadian purchases of the Allied Powers.

We have been and are now performing inspec-

STERLING MOTOR TRUCKS

A complete line in stock for immediate delivery.

EDWARD R. BACON COMPANY, Pacific Coast Agents
51-53 Minna Street, San Francisco Telephone Sutter 1675

tion work on orders for the British, Russian, Italian, Netherlands and French Governments. These services cover not only munitions, but also railway and other equipment, and steel rails and their accessories.

We venture to suggest that our time-tried organization is equipped to render to the United States Government more efficient service than would be possible by a more newly organized one, and also that with the technical education as well as practical knowledge of our staff and corps of assistants, our governmental authorities could with safety relieve from inspection duties officers whose services would be of great value in other directions, particularly in view of the present national necessities and conditions. Over and above this, we respectfully suggest that it would be of more value to the government to have such an organization as ours giving its service as an intact body rather than that the efforts of the individual members of the organization should be rendered to the government in other fields, and thereby crippling the efficiency of the organization. This particularly in view of the fact that the organization is now rendering valuable service to existing industrial elements whose successful maintenance and operation is essential to the national welfare. You will please appreciate that we have the largest, oldest and without doubt the best known organization of its kind in the world, and we feel that it can be and should be used to advantage for the benefit of the nation, and we are willing and anxious that it should be without profit or emolument to ourselves as individuals.

Respectfully submitting the above, and holding each one of our firm in readiness to respond to your call for consultation or otherwise as you may desire, I remain,

Respectfully yours,
ROBERT W. HUNT & CO.,
By Robert W. Hunt.

Soon after the receipt of this letter the government commissioned Robert W. Hunt & Company to inspect the following materials, the estimated value of which is said to be not less than $80,000,000:

150,000 tons of rails.
5,000 sets of turnouts.
435,000 prs. angle bars.
13,000 kegs track bolts.
50,000 forged steel rail braces.
177,000 pine ties.
15,000 oak ties.
3,800 switch lamps.
37,000 kegs of spikes.
1,000 tons relaying rails with angle bars.
11,103 axles for artillery vehicles.
195 steam locomotives.
189 gasoline locomotives.
680 consolidation locomotives.
1,000 box cars without cabs.
900 box cars with cabs.
1,466 box cars.
1,400 flat cars.
466 tank cars.
300 refrigerator cars.
3,315 gondola cars.
333 dump cars.
9 pile drivers.
4 steam shovels.
20 hoisting engines.
20 graders.
10 steam cranes.
5,800 tons 80 lb. rails.
19,000 tons 25 lb. rails.
200 switches.
220 crossings.
109 lanterns and globes.
2,140 tons 80 lb. approximately for special track work.
35,000 pine ties.
10 locomotive cranes.

Speaking of this work, Mr. Wm. B. Gester, Pacific Coast manager, writes:

"The work described as having been accepted for performance by Robert W. Hunt & Company, is now being done by them at actual cost, members of the firm deriving absolutely no profit from it.

"It may be also interesting to state that there are now about seven hundred men in the organization whose services have been offered to the government by Robert W. Hunt & Company."

Promotion for Mr. Hilts

Mr. H. E. Hilts, formerly District Engineer at San Francisco for the Portland Cement Association, has been elected by the Board of Directors of that body to succeed the late Mr. J. P. Beck as general manager.

Mr. Hilts was born in New York and obtained his technical and engineering education at the University of Pennsylvania. His first work was as rodman with the Mexican International Railroad. Later he was in the employ of the Philadelphia and Western Railroad. For two years he was instructor in the Engineering Department of the University of Pennsylvania, after which he entered the service of the New York Central Railroad, leaving that company to become associated with the Portland Cement Association as Road Engineer in 1913, for territory comprising the New England and Northeastern states, having been stationed at Albany and Easton, Pennsylvania. In 1915 he was appointed District Engineer at San Francisco.

Mr. Hilts is an associate member of the American Society of Civil Engineers, member of American Society for Testing Materials, associate member of the American Railway Engineering Association and member of the American Concrete Institute.

Hard Times for Builders

A lot of people are making money these days, but the builders are having a time of it:

The architect has to draw before a job is started.

The excavator has to keep digging to make a living.

The plumber is in the hole.

The brickman has gone to the wall.

The plasterer is up against it.

The sash and door man says there are few openings for him.

The glass man expects to crash any time.

The carpenter's business is cut in two.

The cement man finds things pretty hard.

The paper hanger has a hard time to stick to his business.

The floor man is on his knees.

The fixture man's business is light.

And we see the painter's finish.

WARREN J. BEEBE.

KEWANEE
GARBAGE BURNERS AND BOILERS

YEOMANS
BILGE PUMPS
EJECTORS
HOUSE PUMPS

LOUDEN
SANITARY
BARN EQUIPMENT

CALIFORNIA HYDRAULIC ENGINEERING & SUPPLY CO., 80 Fremont St., S. F.

Phone MISSION 4405

P. R. WARD Formerly Ward & Goodwin
GENERAL CONTRACTOR
981 GUERRERO STREET SAN FRANCISCO

ONE PIECE SANITARY DRAINBOARDS, SINKBACKS, FLOORS, WAINSCOTING, ETC.
GERMANWOOD FLOOR CO.
Phone West 4009 1621 EDDY STREET, SAN FRANCISCO

HOWARD CO.
CEMENT, ROCK, PLASTER, GRAVEL, BRICK and SAND
Phone Lakeside 27 1st and Market Sts., Oakland

G. W. COURTNEY
CONTRACTOR
Phone Franklin 4800 160 EDDY STREET, SAN FRANCISCO

L. G. BERGREN & SON
GENERAL CONTRACTORS
347 CALL BUILDING SAN FRANCISCO, CAL.

PLUMBING HEATING
NEIL H. DUNN
CONTRACTOR
786 ELLIS STREET S. F. Phone Franklin 2187

J. B. CROWE
Glass of All Kinds
1372-74-76 TURK ST., SAN FRANCISCO Tel. West 1398

LANDSCAPE ARCHITECTS
NEAL T. CHILDS COMPANY Phone Sutter 4933
WE PLAN HOME GROUNDS AND REALTY TRACTS 68 POST STREET
TREE SURGERY AND CONSULTING FORESTRY SAN FRANCISCO

Subscription Price of Trade Papers

Publishers of trade papers throughout the United States have borne with great patience the burden that has been imposed upon them since the beginning of the war by the enormous advance in the price of paper. Publishers, as a rule, dislike to complain to their patrons. They have to listen to so many complaints from others that their sympathies become over wrought and they keep their business troubles to themselves. But now and then the limits of patience are undone and the publisher finds relief in a word or two on a subject that disturbs his peace of mind whenever he pays a bill for print paper. Ponder this from the Cement and Engineering News of Chicago:

Suppose trade papers were to charge subscribers what it costs to produce them. They would have to charge about three times the present rates. Would men pay $9 a year for the trade papers they now get for $3? Some would; many would not. But the trade papers are, most of them, worth more than three times their cost to their subscribers. As a matter of reason, why should they not charge what they are worth? Probably not a reader of any good trade paper but gets the worth of what it cost him for a year in one article in one issue. Why, therefore, should he not pay at least what the paper costs to produce? Somebody can answer this query in some other manner than to say simply that he won't. He won't because he has never been asked to, for one reason; but it is not the conclusive reason. He won't because he does not have to, is not a reason at all, but is the excuse the readers themselves are content with. Nothing in business is sold for so small a proportion of its value as the good trade paper.

Boston Flushing Valve

Crane Company have recently issued a new catalogue (No. 50) which will be mailed to architects and others interested by addressing any of the company's coast offices. The company has also just published a pamphlet descriptive of their air regulated Boston flushing valve.

Church Plans Being Prepared

Mr. Edwin J. Symmes, Pacific building, San Francisco, is preparing plans for a new edifice for the Baptist Church at Rio Vista. Preliminary sketches for the work have been approved. Construction is to be frame and plaster.

M & G REVOLVING SCREENS

are made in a variety of approved designs and in all sizes

OUR MANY YEARS OF EXPERIENCE IN THE MANUFACTURE OF SCREENING EQUIPMENT IS YOUR GUARANTEE OF A SUCCESSFUL INSTALLATION.

Meese & Gottfried Company

ENGINEERS AND MANUFACTURERS

Conveying, Elevating, Screening and Mechanical Power Transmitting Machinery

SAN FRANCISCO LOS ANGELES
SEATTLE PORTLAND

Send for Catalog

CHARLES T. PHILLIPS
CONSULTING ENGINEER
PACIFIC BUILDING SAN FRANCISCO
HEATING VENTILATION WIRING ILLUMINATION

The First National Bank at Portland, Oregon
is a fine example of modern bank architecture. The best of materials were employed throughout. These included 10,000 yards of

"Spiral" Armco Iron Lath
a type unequalled for efficiency and long service life.

Armco Iron Resists Rust
because of its remarkable purity and evenness and the care bestowed on every phase of its production.

AMERICAN ARMCO IRON

The trade mark ARMCO carries the assurance that iron bearing that mark is manufactured by The American Rolling Mill Company with the skill, intelligence and fidelity associated with its products, and hence can be depended upon to possess in the highest degree the merit claimed for it.

THE AMERICAN ROLLING MILL COMPANY
MIDDLETOWN, OHIO

Licensed Manufacturers under Patents granted to the International Metal Products Company

ARMCO Iron Sheets, Plates, Roofing, Pipe, Gutter and Metal Lath

Pacific Coast Sales Office — Monadnock Building, San Francisco; other Branch Offices in New York, Chicago, Pittsburgh, Cleveland, Detroit, St. Louis, Cincinnati, Atlanta, and Washington, D. C.

AN AMLE STOCK OF ARMCO IRON IS CARRIED AT SAN FRANCISCO.

VIEW OF STOCK ROOM, H. N. COOK BELTING COMPANY, SAN FRANCISCO

New Home of H. N. Cook Belting Company

THE educational value of the Exposition has manifested itself in many ways in the last two years in the pleasing effects produced by some of our best and most up-to-date architects, who have here and there added a dash of individuality and color to relieve the dull monotony of a landscape made up of stereotype structures built by conservative architects for conservative owners.

The H. N. Cook Belting Company has ignored precedent and recently erected a building according to their own ideas and one which is especially adapted to their purpose. The building, which is fashioned somewhat along Exposition lines, was planned for them by the well-known architects, Messrs. Ward & Blohme, and constructed by Messrs. Barrett & Hilp, general contractors. The building combines all the essential features of factory construction, principal of which is good light, with an architectural beauty which is not excelled anywhere in buildings constructed for manufacturing purposes. The building is equipped with indirect lighting system, Otis elevator of hydro-pneumatic type, compressed air hoists, and other modern appliances. The offices are located on the mezzanine floor over the driveway, commanding a view of both store and factory, which makes a convenient as well as a very pleasing arrangement.

The company recently purchased the corner, 91 ft. 8 in. by 157 ft. 6 in., Howard and Fremont streets, on which their new building stands. There has been more activity in this district in the last six months than there has been in several years, and the H. N. Cook Belting Company has in a substantial way shown its faith in the future of San Francisco in the splendid building which they have erected for themselves. Two views of the company's new home are shown elsewhere in this issue.

Equipping Steel Ships

NePage, McKenny Company, electrical engineers and contractors, having offices at Seattle, Portland and San Francisco, report contract for complete electrical equipment in ten 9400-ton steel steamships being constructed for the United States Government by Moore & Scott, shipbuilders of San Francisco, the contract for this work being secured through the San Francisco office. They also report that the Portland office has secured a contract for the electrical equipment in ten wooden ships being constructed at Portland by Supple & Ballin Shipbuilding Corporation. They also have the contract for equipping practically all of the wooden vessels with electrical steering gear.

Additions to Alameda Infirmary

The supervisors of Alameda county have authorized the enlargement of the dormitories and nurses' quarters at the county hospital.

Care of Oak Floors is Simple

All floors require some attention. No housewife expects to keep her floors looking beautiful without some attention. Naturally every housewife wants to find the simplest way of giving her floors the attention they need. In searching for this simplest way many housewives have adopted methods that experts on floor finishes know are very ruinous to the finish, and very often to the wood itself.

If one only knows how, nothing is easier than the care of a well finished oak floor. Usually the care of floors is entrusted to the discretion of servants whose intentions may be good but whose methods are more often bad.

There are several preparations put up by varnish and wax manufacturers that give excellent results for cleaning and the care of oak floors which can be bought at any department or paint store.

Never use water, oil, kerosene, turpentine, soap, Gold Dust, Dutch Cleanser, or any other cleansing agents, except as follows:

Shellac finish: If water has been spilled upon the floor and it has turned white in places, moisten a soft cloth with a little alcohol and lightly rub the spots, which should immediately disappear. Do not repeat this operation too often, however, or the finish will be entirely removed. Shellaced floors sometimes take on a clouded or grayish appearance due to dampness in the air. This condition can usually be greatly improved by the same treatment as above. If the finish has become so dirty that it is necessary to remove same entirely, first scrub the floor with wood alcohol and then bleach it with oxalic acid—never use lye, as it turns the wood black and ruins the surface permanently. After all moisture has evaporated the original finish may be applied.

Varnish finish: If the finish has become badly worn, thoroughly scrub it with a brush and Sapolio and water (never flood the floor). After it has dried out, apply a thin coat of varnish; or in case time cannot be allowed for the varnish to dry, wax may be substituted. Do not use shellac on top of old varnish or varnish on top of old shellac.

A Dependable Door Device

Hundreds of Architects all over America have for years specified

RELIANCE BALL BEARING DOOR HANGERS

because of their proven satisfaction. Are you among them? If not, write us at once and you will soon be in position to join the mighty host of architects who are "Reliance" Hanger friends.

The principle of construction of the "Reliance" Hanger provides against complicated and expense-ercating parts. It involves the use of only two or three telescoping pieces of steel with balls between.

Lowest Possible Maintenance Cost and Installation Expense, and Longest Possible Service

Write for Catalog

RELIANCE BALL BEARING DOOR HANGER CO.

70 EAST 45th ST., NEW YORK

PACIFIC COAST AGENTS

B. V. Coltins.....Los Angeles, Cal.
Sartorius Co.....San Francisco, Cal.
Columbia Wire & Iron Works....Portland, Ore.
D. E. Fryer & Co., Seattle, Spokane and Tacoma, Wash., Great Falls, Montana.

Wax finish: Waxed floors should be dusted daily with a broom covered with canton flannel. Keep a can of wax on hand, and should the finish become worn in the doorways or elsewhere, apply a thin coat, rubbing well into the wood. Allow the wax to dry for one hour and then polish thoroughly. Before rewaxing the floor, scrub it thoroughly with turpentine and a piece of cheese cloth.

Illinois Plant Expands

The Illinois Engineering Company, Chicago, Ill., has purchased a new plant at Racine avenue and 21st street. The lot is 118½x100 ft and it has been improved with a one-story reinforced concrete and steel building, containing 30,000 square feet of floor space. The reported purchase price is $65,000, subject to an incumbrance of $30,000. The company manufactures vapor and vacuum heating systems and specialties for power plants.

MODERN PLUMBING FIXTURES

HAINES, JONES & CADBURY CO.
MAKERS OF PLUMBING SUPPLIES
1130-1144 RIDGE AVENUE PHILADELPHIA
BRANCHES - SAVANNAH AND SAN FRANCISCO
San Francisco Office and Showroom
857 Folsom Street

H. H. LARSEN, 101 Woodland Ave. N. LARSEN, 230 Haight St.
H. H. LARSEN & BRO.
MASONS and BUILDERS
Phone Douglas 4249 Office 62 POST ST., Room 331, San Francisco

ROBERT TROST PHONE MISSION 2209
General Building Contractor
We Specialize In High Grade Work and Employ Skilled Labor in every Branch of the Building Industry.
26th and Howard Streets SAN FRANCISCO

Atlas Heating and Ventilating Co., Inc.
ENGINEERS and CONTRACTORS
STEAM AND HOT WATER HEATING, FANS, BLOWERS, FURNACES, POWER PLANTS--SHEET METAL WORK
Phone Douglas 378 Fourth and Freelon Sts., Bet. Bryant & Brannan, SAN FRANCISCO.

J. W. BENDER ROOFING & PAVING CO.
(Members of Builders Exchange, 180 Jessie St. General Contractors Assn., 110 Jessie St.)
WATERPROOFING AND COMPOSITION ROOFING
MASTIC AND BITUMEN PAVING
General Offices:
576 Monadnock Building San Francisco Telephone Douglas 4657

HEATING VENTILATION
Automatic Sprinkler Systems
FLOOR AND WALL TILING
PLUMBING SHEET METAL WORK
SCOTT CO., INC.
SUCCESSOR TO JOHN G. SUTTON CO.
243 MINNA STREET SAN FRANCISCO

BARRETT & HILP
Concrete Construction & General Contractors
SHARON BUILDING SAN FRANCISCO SUTTER 4598

Dolan Wrecking & Construction Co.
(D. J. DOLAN)
Lumber, Lath, Nails, Shingles, Doors, Windows and Plumbing Supplies, New and Second Hand
Phone Market 4264 Office and Yard, 1607-1639 MARKET ST., SAN FRANCISCO

When writing to Advertisers please mention this magazine.

Enters School Supply Field

In its expansion the Rucker Fuller Desk Company has taken over the California branch of the A. H. Andrews Company, whose line of school desks has won during the last half century an international reputation. "Andrews school desks" is a phrase known by all school people to mean a standard of quality and excellence. Besides representing the Andrews factory the Rucker Fuller Desk Company are the Coast distributors of Beaver Blackboard, a product of the Beaver Board Companies that is fast becoming recognized for its excellent qualities.

Branches in Oakland and Los Angeles will afford the buyer the same opportunity as the main store in San Francisco.

Cement in Bulk

The plan to buy cement in bulk which is being advocated by the Cement Association, has many advantages. It is stated that a positive economy can be effected in almost all large concreting operations by purchasing cement in bulk when carload lots are required. It is estimated that the efficiency of handling bulk cement in wheelbarrows is fully 10 per cent greater than in handling it in sacks. There is a considerable saving in cement lost in sacks and of time in emptying, examining, and packing sacks, beside the direct cost of sacks. On large jobs special conveyors are efficient for unloading the cars and delivering the cement to the concrete mixer.

What the Big Cantonments Will Require

With the prospects of California drawing one of the big cantonments, some idea of their size may be had from the figures given out in connection with the cantonment at Annapolis Junction, Md. There will be 28,000 squares of roofing; 20 carloads of plumbing, 192 carloads tanks, heaters, stoves, ranges, piping, electrical material and refrigerators; 10 carloads of electric light poles, wires, insulators, etc.; 70 carloads of cement, 175 carloads of sand, 350 carloads of crushed stone, 3 carloads of fly screens, 130 carloads of piping and drains for water and sewage.

Department Store Building

W. J. Dodd and Wm. Richards, 809 Brockman building, Los Angeles, have plans for a six-story and basement Class "A" department store building for the Seventh Street Fireproof Building Company. All the buildings on the site were vacated January 1. The building will be 197 by 140 feet, of reinforced concrete construction with brick and terra cotta facing, hollow tile partitions, metal frames and sash and wired glass, plate glass and metal store fronts.

The Elevator Floor—

Whether in Office Building, Hotel or Department Store is subjected to an enormous amount of wear and tear.

Specify

Interlocking Rubber Tiling

and you've provided your client's building with a Durable, Economical, Practical material that is bound to give satisfaction.

Stock on hand for immediate delivery.

New York Belting and Packing Co.

New York

San Francisco Branch
519 MISSION STREET
Phone Douglas 1837

Small booklet of designs mailed on request.

Building Material Specialists

Announcement is made that on September 1st the Waterhouse-Wilcox Company took over the various agencies heretofore handled by the U. S. Metal Products Company, including the mail chute of the American Mailing Device Corporation of New York. Mr. Wilcox is well known as formerly with Waterhouse & Price and later with the U. S. Metal Products Company. Offices and display rooms have been fitted up in the Monadnock Building Arcade.

Highway Engineers

Mr. J. C. North of Fresno and Mr. Shirley Bright of San Bernardino, surveyors and civil engineers, who have seen official experience in their own counties in connection with highway systems, have been appointed county highway division engineers by the board of supervisors of Tulare county. These men will work under direction of Mr. Byron O. Lovelace, county surveyor.

School Superintendent to Build

Messrs. Sala and Mayo, Commercial Savings Bank building, Stockton, have plans complete for a $5000 residence for Mr. John Anderson, superintendent of the Stockton public schools.

BEAVER BLACKBOARD
BEAVER GREENBOARD
SCHOOL FURNITURE
AND SUPPLIES—
OFFICE, BANK AND
COURTHOUSE FURNITURE—
THEATRE AND
AUDITORIUM SEATING
Rucker-Fuller Desk Co.
677 Mission St., SAN FRANCISCO, CAL.
120 So. Spring St., LOS ANGELES, CAL.
432 - 14th Street - OAKLAND, CAL.

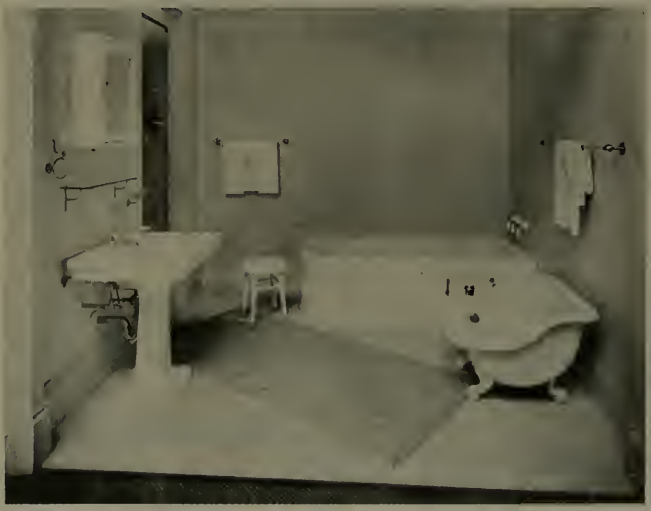
Western Vacuum Supply Co.
CALIFORNIA AGENTS FOR
Palm Vacuum Cleaners
ANY SERVICE
ANY CAPACITY
Plants Noiseless in Operation
Office and Demonstrating Room:
1125 Market St. Telephone Park 4294
Rialto Theatre Building San Francisco

Heavy service demands
California Redwood
BLOCK PAVING
Economical—costs less to lay and has longer life than other pavings.
Durable—will stand the heaviest traffic and outlive asphalt, brick or concrete.
Noiseless, dustless, sanitary.
Maintenance costs practically nothing.
Easy on the feet of employes.
And Redwood contains a *natural* preservative—does not require *artificial* preservatives to insure long life.
Resists rot and fire. Permanent in shape.
Write today for free booklet, "California Redwood Block Paving," and full information.
CALIFORNIA REDWOOD ASSOCIATION
723 CALL BUILDING, SAN FRANCISCO

Basement of Palace Hotel, San Francisco Paved with California Redwood Block Paving.

PLUMBING GOODS

OF QUALITY



REFINEMENT and ELEGANCE Distinguish the Bath room Fixtures shown in this picture. It is a photograph of one of several Bath rooms which may be seen under Water Pressure at our New Up-Town Display Room, 64 Sutter Street, San Francisco. Architects and others interested in High Grade Plumbing Fixtures are Cordially Invited to Call.

Holbrook, Merrill & Stetson

DEALERS IN

PLUMBERS' SUPPLIES, IRON PIPE AND FITTINGS, METALS
STEAM, WATER AND HOT AIR HEATING APPARATUS
STOVES, RANGES AND KITCHEN UTENSILS

Main Office and Warehouse

SIXTH, TOWNSEND AND BLUXOME STREETS, SAN FRANCISCO

Schaw-Batcher Co.
Pipe Works

RIVETED STEEL PIPE
PRESSURE TANKS
STORAGE TANKS
WELL CASING

ALL KINDS HEAVY STEEL PLATE WORK

356 Market St., San Francisco Works, South San Francisco

You will always remember your Eastern Trip

IF YOU TRAVEL VIA
"THE SCENIC ROUTE"

WESTERN PACIFIC
DENVER & RIO GRANDE

THROUGH THE FEATHER RIVER CANYON AND ROYAL GORGE

2 — TRAINS DAILY — 2

— FOR —

SALT LAKE CITY, DENVER, KANSAS CITY, ST. LOUIS, CHICAGO

AND

ALL EASTERN POINTS

Ask Any WESTERN PACIFIC Agent

or

BODE K. SMITH, General Passenger Agent,
961 Mills Building, San Francisco

Four Routes East!

SUNSET ROUTE: Along the Mission Trail, and through the Dixieland of song and story. To New Orleans via Los Angeles, El Paso, Houston, and San Antonio. Southern Pacific Atlantic Steamship Line, sailing New Orleans to New York.

OGDEN ROUTE: Across the Sierras and over the Great Salt Lake Cut-off. To Chicago via Ogden and Omaha; also to St. Louis via Ogden, Denver and Kansas City.

SHASTA ROUTE: Skirting majestic Mount Shasta and crossing the Siskiyous. To Portland, Tacoma and Seattle.

EL PASO ROUTE: The "Golden State Route" through the Southwest. To Chicago and St. Louis via Los Angeles, Tucson, El Paso, and Kansas City.

Oil Burning Locomotives

No Cinders, No Smudge, No Annoying Smoke

Unexcelled Dining Car Service

FOR FARES AND TRAIN SERVICE ASK ANY AGENT

Southern Pacific

Write for folder on the Apache Trail of Arizona.

Atkinson Safety Window

Mill
Second
and
Webster
Streets
Oakland

ESTABLISHED 1858

MUELLER

High Grade Faucets

FOR

BATH, LAVATORY AND SINK

Give Long Service, Cut Out Repairs, Fully Warranted

H. MUELLER MFG. CO.

589 Mission St., SAN FRANCISCO

C. DRUCKER J. C. JAMES

JAMES & DRUCKER

PLUMBING—HEATING
CONTRACTORS

Phone Market 275

450 Hayes Street
San Francisco

MARK-LALLY CO.

PLUMBING and STEAM SUPPLIES

"PERFECTION"
FLUSH VALVES

SHOWROOMS AND OFFICE

235-249 2nd St., San Francisco
CALIFORNIA

OAKLAND
SAN JOSE

Branches

FRESNO
STOCKTON

Phone Douglas 3224

Hunter & Hudson

ENGINEERS

Designers of Heating, Ventilating and Wiring Systems. Mechanical and Electrical Equipment of Buildings.

729 Rialto Bldg., San Francisco, Cal.

Phone Sutter 2419

JOHN MONK

GENERAL
CONTRACTOR

316 Sharon Bldg. San Francisco

PHONE FRANKLIN 5598

THE TORMEY CO.

Versatile Decorators

General Painters
Wall Paper

1042 Larkin St., San Francisco, Cal.

Architectural Scale Models

EXECUTED IN
PLASTER and PLASTICINE

B. V. Gerow

509 23rd Avenue San Francisco

Phone Sutter 1687

THE RIGNEY TILE CO.

Successors to

CALIFORNIA TILE CONTRACTING CO.

ESTIMATES FURNISHED

Sheldon Building
1st and Market Sts. SAN FRANCISCO

"BLAZING" THE TRAIL

We've been doing it for many years—giving the Sportsman Better Value for Quality than he ever before received. *"Value at a Fair Price"* in everything for the Sportsman.

The Ellery Arms Company
563-65 MARKET ST
SAN FRANCISCO, CAL.

SEND FOR CATALOG *The Sign of Quality*

National Surety Company of New York

ASSETS OVER $12,000,000.

The bonds of this Company are accepted by the United States Government in larger amounts than any other Surety Company in the World.

PACIFIC COAST DEPARTMENT,
105 MONTGOMERY STREET,
SAN FRANCISCO, CAL.
Frank L. Gilbert, Vice-President.
Phone, Sutter 2636

KEWANEE WATER SUPPLY SYSTEMS

A Perfect Water Supply to Country Homes, Hotels and Parks.

SIMONDS MACHINERY CO.
117-121 New Montgomery St., San Francisco

Interior Decorations a Specialty
Drapes, Sketches, Color Schemes Furnished on Request

Golden Gate Decorating Co.

704 Polk Street, at Eddy, San Francisco. Tel. Prospect 2685
R. L. McQUADE, Manager

Expert Designers in Home Decorations

House Painting, Graining, Glazing
Expert Paper Hanging
Apartment and Hotel Work a Specialty
Prompt Service—All Work Guaranteed

A. J. FORBES & SON

Established in San Francisco in 1850

Office and Factory, 1530 FILBERT ST., S. F.
Builders Ex. Box 236

Bank, Store and Office Fittings

Special Furniture and Interior Woodwork

MAGNER BROS.

PAINT MAKERS

Floratone Flat Wall Paint
Mabro Concrete Paint
Concrete Floor Paint
Mabro Stipple Paint
Mabro Enamels and Enamel Undercoaters

414 - 424 Ninth Street,
SAN FRANCISCO, CAL.

"Chief Sentry" Gasoline Outfit

BOWSER
ESTABLISHED 1885

Oil and Gasoline Storage Systems

Are specified in modern garages. Include Bowser Equipment in your plans. It means satisfied clients for you because of the saving, safety and complete convenience of the Bowser System.

Write or 'phone us. We will be glad to co-operate with you in planning oil storage systems for all classes of buildings.

S. F. Bowser & Co., Inc., Ft. Wayne, Ind., U. S. A.

San Francisco Office
612 Howard St.

Telephone
Douglas 4323

THE BRUNSWICK-BALKE-COLLENDER CO.'S
WHALE-BONE-ITE
REG. PAT. OFFICE
CLOSET SEATS

A Construction Of B Whale Bone-Ite Seat

Sanitation — Durability

LIFE-LONG SERVICE combined in this hard rubber product. Note construction and that heavy thick rubber covering which is impervious; acid proof; one composite piece; does not crack or era e.

When cleaned with alcohol is made absolutely aseptic

Specify Whale-Bone-Ite Toilet Seats and give your client a fixture that positively fills the requirements.

Styles for all Standard Type Bowls.

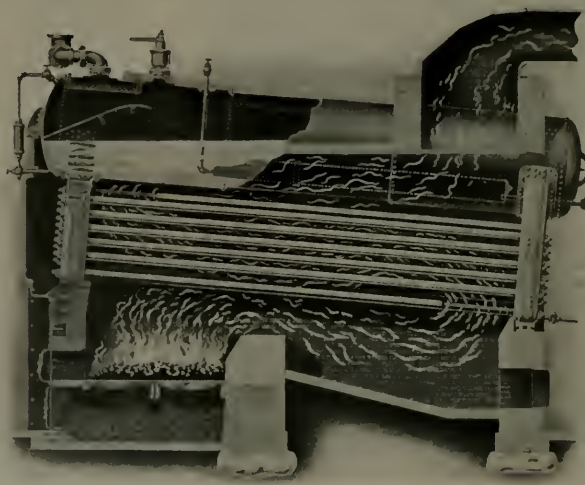
Note Patent Concealed Type Hinges

THE BRUNSWICK-BALKE-COLLENDER CO.
623 SO WABASH AVE CHICAGO

Sold by all Leading Plumbing Jobbers

The FRANKLIN Water-Tube Boiler

COMPLYING WITH THE CALIFORNIA CODE



DESCRIPTION

Your Attention Invited

Safety Under High Pressure through proper choice of materials.

Unimpeded Circulation through correct design.

High Furnace Temperature, resulting in complete combustion.

Heating Surface properly disposed to absorb heat.

Easy Cleaning and Inspection from outside front and rear.

Hand-Hole Plate Joints tightened by internal pressure.

Method of Support, ideal for contraction and expansion.

Many Other Meritorious Features

INSTALLATIONS

YOUR INSPECTION INVITED

Y. M. C. A. Building, S. F.	3—104 H.P.	312 H.P.
St. Luke's Hospital, S.F.	2—150 H.P.	300 H.P.
St. Mary's Hospital, S. F.	2—135 H.P.	270 H.P.
University of Cal. Hospital, S. F.	2—165 H.P.	330 H.P.
Examiner Building, S. F.	2—119 H.P.	238 H.P.
Whitney Building, S. F.	2—143 H.P.	286 H.P.
Hotel Del Monte, Monterey	1—220 H.P.	220 H.P.
Sbatiuck Hotel, Berkeley	2— 90 H.P.	180 H.P.
Cal. Paper & Bd. Mills, Antioch.	2—270 H.P.	540 H.P.
Cal. Paper & Bd. Mills, Antioch.	3—190 H.P.	570 H.P.
Western Meat Co., S. F.	2—104 H.P.	208 H.P.
Oakland Meat Co., Oakland	1—143 H.P.	143 H.P.
Belmont School, Belmont	1—104 H.P.	104 H.P.
St. Joseph's Home	2—104 H.P.	208 H.P.
D. Ghiradelli & Co., S. F.	1—152 H.P.	152 H.P.
Rialto Bldg., S. F.	1—135 H.P.	135 H.P.
Fairmont Hotel, S. F.	2—104 H.P.	208 H.P.
Total		4404 H.P.

Send for Catalog "E"

SELLING AGENTS

GENERAL MACHINERY & SUPPLY CO.

39-51 Stevenson Street, San Francisco, Cal.

Color in Architecture—

The tendency today is to put more color into our buildings — inside and out. Architects are keenly interested in any material that will add color to their work, and at the same time possesses some structural value.

The above cut represents the 2-inch series Glass Brick together with sectional view. The glass facing is at least ¾-inch thick. The glass face extends beyond the concrete 1/16-inch. This provides a shoulder to hold the mortar joint in place and enables the mason to use a liberal mortar spread between the body of the bricks and at the same time obtain a thinner joint at the exposed surface. The concrete body is the same size as the standard size brick. This is the brick for permanent beauty, sanitary effects, and water contact. Brick is made in standard 4-inch depth also. Catalogue, showing shapes, sent on request.

Glass Brick—

has been found to possess both artistic and structural merits. The brick is manufactured in any desired tone—bright or subdued — and experiments have demonstrated its practicability as a substitute for Clay Brick for Exterior Walls of Hotels, Apartment Houses and Hospitals; also a splendid substitute (and far more Economical) for Glazed and Enamel Brick and Tile for Light Courts, Swimming Pools, Mausoleums, Bakeries and Garages.

In addition to Glass Brick we handle Glass Wall Tile, Glass Floor Tile and Glass Base.

California Glass Brick Company

General Sales Office
228 GRANT AVENUE

SAN FRANCISCO, CAL.
Phone, Garfield 2042

"FIRE—A CRIME"

We are equipped with two Pacific Coast Factories to manufacture
METAL DOORS—Tin, Kalamein, Composite, Hollow Steel and Bronze.—Swinging, Sliding, Folding, Elevator, Van Kannel Revolving Doors, and Wilson's Steel Rolling Doors.
METAL WINDOWS—Underwriters, Hollow Metal of all kinds, Kalamein, Bronze and Steel Sash.
☞ See the SIMPLEX METAL WINDOW.

United States Metal Products Co.

OF THE PACIFIC COAST
555 Tenth St., San Francisco 750 Keller St., Los Angeles
Agents and Branches in all Coast Cities.

POPE & TALBOT

Manufacturers, Exporters and Dealers in

Lumber, Timber, Piles, Spars, etc.

Office, Yards and Planing Mills
859-869 THIRD ST., SAN FRANCISCO, CAL.
Mills, Port Gamble, Port Ludlow and Utsalady, Washington

A. S. MANGRUM, PRES. AND MGR.

MANGRUM & OTTER
(INCORPORATED)

TILING MANTELS GRATES

FURNACE AND STEAM HEATING

HOTEL AND KITCHEN OUTFITS
Stoves, Ranges, Refrigerators, Tin and Enameled Ware

Telephone, Kearny 3155 561-563 Mission St., San Francisco

DENISON INTERLOCKING TILE

and all kinds of

CLAY PRODUCTS

Phone MAIN 2028

CANNON-PHILLIPS COMPANY

Incorporated
Successors to DENISON BLOCK COMPANY
Plant North Sacramento 920 FORUM BUILDING SACRAMENTO, CAL.

STANDARD VARNISH WORKS

NEW YORK CHICAGO LONDON

SAN FRANCISCO PARIS BERLIN BRUSSELS MELBOURNE

INTERNATIONAL VARNISH CO. Limited TORONTO

LARGEST IN THE WORLD AND FIRST TO ESTABLISH DEFINITE QUALITY STANDARDS

TRADE ELASTICA MARK.

ELASTICA —No 1—

ELASTICA —No 2—

ELASTICA Floor Finish

ELASTICA Cabinet Finish

KLEARTONE Stains

Architectural Varnishes

One for every class of work

Satinette ENAMEL

IMMACULATE

IT STANDS TO REASON

That a client will be satisfied, if his interior trim is finished with

BERRY BROTHERS

Architectural Finishes

because they are the best made.

LIQUID GRANITE — Floor Varnish.
LUXEBERRY WOOD FINISH — For interior trim.
LUXEBERRY WHITE ENAMEL — Whitest white, stays white.
LUXEBERRY SPAR — For front doors and exposed woodwork.

BERRY BROTHERS
INCORPORATED
World's Largest Varnish Makers

SAN FRANCISCO DETROIT WALKERVILLE, ONT.

FOR YOUR WATER-PROOFING SPECIFY **TIGEROIL**

EQUALLY GOOD FOR IRON, SHEET METAL OR WOOD
A POSITIVE RUST PREVENTIVE AND WOOD PRESERVER

"Tigeroil" is one of the best waterproofing coatings known. It forms a hard, elastic, non-porous coating and is not affected by either salt or fresh water.

It is a transparent preparation, easily applied to metallic surfaces by spraying, brushing or dipping. It forms a thin waterproof coating, guaranteed to exclude all moisture and prevent rust. SAMPLES AND PRICES ON REQUEST. Manufactured by

PACIFIC COAST PAINT CORPORATION

OAKLAND, CALIFORNIA

General Offices and Factory
1111 to 1119 E. 11th St. Phone Merritt 407

San Francisco Office
112 Market St. Phone Sutter 2690

Clinton Welded Wire Fabric

CLINTON WIRE LATH

L. A. NORRIS COMPANY

Phone Kearny 5375 140 Townsend Street, San Francisco

The PARAMOUNT GAS RADIATOR

The Gas Radiator Without a Fault.

Manufactured and Sold by

Modern Appliance Co.

SAN FRANCISCO

128 Sutter St. Phone Sutter 5670

OUR LEADING CIGAR BRANDS

FLOR DEL MUNDO

ALL HAVANA TOBACCO

FLOR DE UPMANN

A MILD, PLEASING BLEND

Goldberg, Bowen & Co.

SAN FRANCISCO OAKLAND

There are more Industrial Buildings under construction and being planned in California today than ever before. Many of them are concrete.

Architects and Consulting Engineers specify and Contractors Buy ONLY Clean Gravel and Crushed Rock for their Concrete Mix.

California Building Material Co.

Office, 500-4 NEW CALL BUILDING, SAN FRANCISCO

Phone Sutter 4845 **Plant at Niles, Cal.**

Pack your Radiator Valves with

Palmetto Twist Packing

It can be unstranded to fit any size valve. It does not get hard.

H. N. COOK BELTING CO.

317-319 Howard St. **San Francisco, Cal.**

MOUNT DIABLO CEMENT
COWELL SANTA CRUZ LIME

ALL KINDS OF

BUILDING MATERIALS

HENRY COWELL LIME AND CEMENT CO.

Phone Kearny 2095 No. 2 MARKET STREET, SAN FRANCISCO

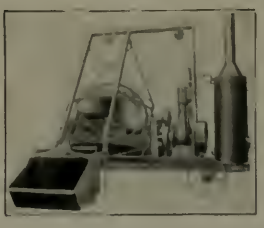
AUSTIN IMPROVED CUBE CONCRETE MIXERS

Made the World's Best Records on the Panama Canal and the Los Angeles Aqueduct.
Built in ten sizes $2\frac{1}{2}$ to 64 cubic feet capacity.
"Special machines for street and road paving."

MEMBER OF NATIONAL ASSOCIATION CONCRETE MIXER MNFRS.

Our Mixer Capacities Based on N. A. M. M. Wet Batch Rating

Municipal Engineering and Contracting Co.
Main Office, Railway Exchange, CHICAGO
Represented by J. H. HANSEN & CO.
BALBOA BLDG., San Francisco. Telephone Douglas 726



GEO. S. MacGRUER
258 Connecticut St. Phone Park 7700

ROBERT M. SIMPSON
483 Monadnock Bldg. Phone Douglas 5889

MacGRUER & CO.
CONTRACTING PLASTERERS
PLAIN AND ORNAMENTAL

Members Builders Exchange
180 Jessie St. Phone Sutter 6700

SAN FRANCISCO

WM. F. WILSON COMPANY
MODERN SANITARY APPLIANCES
Special Systems of Plumbing for Residences, Hotels, Schools, Colleges, Office Buildings, Etc.
Phone Sutter 357 328-330 Mason Street, San Francisco.

A. C. SCHINDLER, President. CHAS. F. STAUFFACHER, Secretary
THE FINK & SCHINDLER CO.
Manufacturers of INTERIOR WOODWORK AND FIXTURES
BANK, OFFICE AND STORE FITTINGS
SPECIAL FURNITURE
218-228 THIRTEENTH ST
Bet. Mission and Howard Sts.
SAN FRANCISCO, CAL.
Telephone: Market 474

J. A. Nelson
J. C. Hurley

J. C. HURLEY CO.

Telephone
Garfield 1959

CONSTRUCTING ENGINEERS
Heating and Ventilating Systems 509-511 Sixth St., SAN FRANCISCO

Underwriters' Labelled Fire Doors and Windows—Kalamein Interior Metal Doors and Trim — Metal Corner Bead — Metal Furniture, etc.

Capitol Art Metal Co., Inc.
Manufacturer of
SHEET METAL PRODUCTS
San Francisco Office, 400-406 NEW CALL BUILDING Tel. Sutter 6553
Factory, RICHMOND, CALIFORNIA

MILLER-ENWRIGHT CO.
SACRAMENTO, CAL.
PLUMBING SUPPLIES
STEAM and PIPE FITTINGS, VALVES, Etc.

PIPE—ALL KINDS
STEAM AND HOT WATER BOILERS
PENINSULAR HOT AIR FURNACES
Catalogues on Application

Phone Franklin 548

I. R. KISSEL
Decorator, Painter and Paperhanger
1747 SACRAMENTO ST., Bet. Polk St. and Van Ness Ave., SAN FRANCISCO

GRAVEL-ROCK
Quick Service any point in the San Joaquin Valley, Calif.
GRANT ROCK AND GRAVEL COMPANY
327-328 Cory Building FRESNO, CALIF.

For Modern RESIDENCES *and* APARTMENTS

PROMETHEUS

The Electric Food and Plate Warmer

Tenants of high-class apartments regard Prometheus as a household necessity—as much so in keeping meals warm as the refrigerator in keeping food cold.
Owners are installing Prometheus as an additional means of securing new and holding old tenants.
Prometheus keeps the meal steaming hot without injuring finest china. Wireless heating units of practically unlimited life, placed independent of shelves, are used exclusively.

THE PROMETHEUS ELECTRIC CO., Manufacturers
M. E. HAMMOND, 217 Humboldt Bank Building, San Francisco

August F. Fick Albert E. Fick

FICK BROTHERS

PAINTERS, PAPER-HANGERS AND DECORATORS

Dealers in
Paints, Oils, Varnishes, Glass

475 HAIGHT ST., San Francisco
Phone Park 4428—Res. Park 2148

Guaranteed Results in Waterproofing and Hardening Concrete, Brick, Stone, Etc.

BY THE

GOFFETTE Preparations

A perfectly successful, simple and inexpensive method of waterproofing and hardening concrete, brick and stone has been worked out by Prof. J. L. Goffette, a Belgian chemist and engineer of high standing.

MANUFACTURED BY

J. L. GOFFETTE CORPORATION

Factory and Warehouse, San Bruno Ave., San Francisco

THE GOFFETTE SALES ASS'N
General Sales Agents
276 Monadnock Bldg., San Francisco

R. E. G. KEENE
Distributor for Northern California
110 Jessie Street, San Francisco
Phone SUTTER 3580

Territory is open for responsible state or district sales agents, correspondence invited. Address GOFFETTE SALES ASSOCIATION, 276 Monadnock Building, San Francisco.

HEATING-PLUMBING

COMPLETE PLUMBING AND HEATING SYSTEMS INSTALLED IN ALL CLASSES OF BUILDINGS ALSO POWER PLANTS

GILLEY-SCHMID CO., Inc.

198 OTIS STREET, SAN FRANCISCO.
Tel. MARKET 965

Phone Franklin 1006

Alex. Coleman

CONTRACTING PLUMBER

706 Ellis Street, San Francisco, Cal.

CALIFORNIA PHOTO-ENGRAVING CO.

DESIGNERS & ILLUSTRATORS
ENGRAVERS ARTISTS
BOOKLETS
FOLDERS

121 SECOND ST. SAN FRANCISCO

McCRAY REFRIGERATORS

BUILT TO ORDER
FOR
Home, Restaurant, Hotel or Club

We Carry a Full Line of Stock Sizes

NATHAN DOHRMANN CO.
Selling Agents
Geary and Stockton Sts., San Francisco

W. C. DUNCAN & CO.

General Contractors

508 Sharon Bldg. San Francisco

THE SPENCER TURBINE VACUUM CLEANER

SAVES MONEY

Easily installed in old as well as new buildings—Operates by Electricity—Twelve sizes ranging from ½ to 40 horse power.

HUGHSON & MERTON CO.
AGENTS
530 Golden Gate Ave.
San Francisco

SIMPLEX STANDARD CRUDE OIL BURNERS

Safety First
Simplicity Next
Efficiency and Quality all the Time
1916 Model—Price Right

Write to
American Standard Oil Burner Co.
7th and Cedar Sts. OAKLAND, CAL.

Locks and Hardware

Representative for LOCKWOOD MFG. CO'S Builders' Hardware.

Display Rooms—7th and TOWNSEND STREETS, San Francisco

PACIFIC HARDWARE & STEEL CO.

The Granite Work on Eldorado County Courthouse; National Bank of D. O. Mills, Sacramento,— and Sen. Nixon Mausoleum, Reno, WAS FURNISHED BY

CALIFORNIA GRANITE COMPANY
Phone Sutter 2646 STONE CONTRACTORS
San Francisco Office, 518 Sharon Bldg. Main Office, Rocklin, Placer Co., Cal.
Quarries, Rocklin and Porterville Telephone Main 82

SARGENT
REG. U. S. PAT. OFF
BUILDING HARDWARE

BENNETT BROS.
514-516 Market Street
SAN FRANCISCO - CAL.

A. KNOWLES R. H. MATHEWSON
KNOWLES & MATHEWSON
CONTRACTORS AND ENGINEERS
Fireproof and Reinforced Concrete Construction
442 Call Bldg., San Francisco, Cal.
Phone Sutter 4712

O. BAMANN, President ERNEST HELD, Vice-President
HOME MANUFACTURING CO.
BANK, STORE AND OFFICE FITTINGS
FURNITURE AND HARDWOOD INTERIORS
CABINET WORK OF EVERY DESCRIPTION
543 and 545 BRANNAN ST. Phone Kearny 1514 San Francisco, Cal.

PACIFIC MANUFACTURING COMPANY
MILLWORK, SASH AND DOORS
Hardwood Interior Trim a Specialty
MAIN OFFICE:
SANTA CLARA, CAL.
SAN FRANCISCO OFFICE, 177 Stevenson Street
OAKLAND.....486 Tenth Street
BERKELEY.....2143 Center Street
SAN JOSE.....16 N. First Street

MOST PRACTICAL and ECONOMICAL ARRANGEMENT for the MODERN EFFICIENT EQUIPMENT OF SCHOOL STAGES FURNISHED GRATIS
We have equipped 95% of those built in California
REFERENCES — Orpheum, Pantages or Empress Theatres, San Francisco. All Turner & Dahnken Houses. Theatres everywhere. Manual Arts High, Los Angeles. Chaffee Union High, Ontario. Santa Cruz High School. Bakersfield High School. And over one hundred others.
HIGHEST GRADE ARTISTIC WORKMANSHIP—CONTINUOUS HELPFUL SERVICE.
EDWIN H. FLAGG SCENIC CO. 1638 LONG BEACH AVE., LOS ANGELES
510 PANTAGES BLDG., SAN FRANCISCO

Thomas Elam Grover C. Elam
THOMAS ELAM & SON
GENERAL CONTRACTORS
Office, Builders' Exchange
180 Jessie Street
SAN FRANCISCO
Phone Sutter 6700

A. LETTICH
365 FELL ST., SAN FRANCISCO
Telephone — Park 234
Plumbing

When writing to Advertisers please mention this magazine.

Joost Brothers, Inc.

1053 Market Street, San Francisco, Cal.

Phone: Market 891

It is our earnest desire to serve our customers as well as they may hope to be served; to maintain lowest possible prices compatible with the high quality of goods which we carry in our large and varied stock.

We endeavor to stock only such goods as we can recommend, such goods bearing, where possible, the name of the manufacturer whose goods they are.

You, "MR. BUYER," know the value of such "trade marks," viz:

"Russwin" Builders' Hardware
"Quickmeal" Stoves and Ranges
"Wright & Ditson" Sporting Goods
"Hot Point" Electric Goods
"Starrett" Machinists' Tools
"W. P. Fuller" Paints
"Robeson" Cutlery

Our line of garden tools, hose, seeds, also screws, taps and dies, nails, wire, guns, ammunition, fishing tackle, etc., is as complete as possible under present abnormal conditions.

We do not charge cartage on any city delivery.

We are represented daily at Builders Exchange, 12 to 1; Builders Industries Association, 1 to 1:30.

Your inquiries and assistance will help us maintain for you the largest retail hardware store in San Francisco.

JOOST BROTHERS, Inc.

MARKET STREET, OPPOSITE JONES STREET, SAN FRANCISCO

INSURANCE SURETY BONDS

J. T. COSTELLO CO.

INSURANCE BROKERS

216 Pine Street, San Francisco Phone Sutter 188

Capital $1,000,000 CALIFORNIA DEPARTMENT Surplus $4,014,186.62

THE FIDELITY AND CASUALTY COMPANY OF NEW YORK

Prompt Service for

BONDS AND CASUALTY INSURANCE

203-206 Merchants Exchange Building SAN FRANCISCO, CAL.

ANY PLACE ANY TIME PROMPTLY "We Serve You"

ROBERTSON & HALL

GENERAL INSURANCE

Phone Sutter 2750 First National Bank Building, San Francisco

Telephone Sutter 5231 Member Insurance Brokers' Exchange

FRED H. BOGGS

INSURANCE

Foxcroft Building, 68 Post Street SAN FRANCISCO

CONTRACT BONDS

Fidelity and Surety Bonds of every kind.

C. K. BENNETT, Manager

FIDELITY AND DEPOSIT COMPANY OF MARYLAND

Telephone Kearny 1452 701 Insurance Exchange, San Francisco, Calif.

PACIFIC DEPARTMENT

Globe Indemnity Company

BONDS and CASUALTY INSURANCE for CONTRACTORS

120 Leidesdorff Street Phone Sutter 2280 SAN FRANCISCO

C. D. VEZEY O. G. LAWTON

LAWTON & VEZEY

BUILDING CONSTRUCTION

PHONE LAKESIDE 91 206 PLAZA BUILDING, OAKLAND

STOCKHOLM & ALLYN

GENERAL CONTRACTORS

Telephone Douglas 4657 Monadnock Building, San Francisco

When writing to Advertisers please mention this magazine.

Phone Kearny 3526

A. H. Bergstrom
Eric Lange

LANGE & BERGSTROM
BUILDING CONTRACTORS
(ESTABLISHED 1900)

207-210 Sharon Bldg. San Francisco

THE FISH FUEL SYSTEM
The Safest, Cleanest, Hottest Fuel on Earth

This SYSTEM supplies Heat, Light and Power at Lowest Cost. A Commercial Plant in operation at 50-54 – 8th St., San Francisco. Telephone Market 4070.

UNION GAS-ELECTRIC COMPANY
PALACE HOTEL SAN FRANCISCO

Member Builders' Exchange
180 Jessie Street
Telephone Sutter 6700

Residence 2909 California Street
Telephone Fillmore 1427

C. C. MOREHOUSE

Plain and Ornamental PLASTERING. Imitation STONE WORK of All Kinds
Exterior CEMENT PLASTERING. Metal FURRING and LATHING
MODELING and CASTING. STUCCO WORK

Office and Shop: 872 FOLSOM ST., San Francisco
TELEPHONE SUTTER 6509

ARTHUR ARLETT
BUILDING CONSTRUCTION

CALL BUILDING SAN FRANCISCO

When writing to Advertisers please mention this magazine.

ALFRED H. VOGT
Formerly FOSTER VOGT COMPANY
CONTRACTOR
231 Builders Exchange Building SAN FRANCISCO

Phone KEARNY 3021
GEORGE A. BOS
GENERAL CONTRACTOR
CONSULTING ENGINEER
HEARST BUILDING
SAN FRANCISCO

P. A. Palmer Peter Petersen W. L. Kelley O. G. Hoaas
PALMER & PETERSEN
Contracting Engineers
774-776 Monadnock Building SAN FRANCISCO, CAL.

Residence 2887 GREEN STREET Res. Phone, West 9451 Office Phone, Sutter 3580
P. MONTAGUE CO.
TEAMING AND GRADING
Office: General Contractors' Assn. 110 Jessie Street, San Francisco

C. L. WOLD Office Phone Sutter 4971 JOSEPH DUNN
C. L. WOLD COMPANY
GENERAL CONTRACTORS
75 SUTTER STREET, Cor. Montgomery, SAN FRANCISCO
GENERAL CONTRACTORS ASSOCIATION Phone Sutter 3580

HOUGHTON CONSTRUCTION CO.
Engineering and Construction
SPECIALIZING IN REINFORCED CONCRETE, RAILWAY and INDUSTRIAL CONSTRUCTION
Main Offices, Flatiron Bldg., San Francisco

J. D. HANNAH
Contractor and Builder
OFFICE: 725 Chronicle Building
San Francisco, Cal.
Telephone Douglas 895
BUILDERS EXCHANGE, 180 JESSIE STREET

D. ZELINSKY & SONS
INCORPORATED
PAINTERS AND DECORATORS
420 TURK STREET, SAN FRANCISCO

UNITED STATES STEEL PRODUCTS CO.

Rialto Building, San Francisco

SELLERS of the products of the American Bridge Co., American Sheet and Tin Plate Co., American Steel and Wire Co., Carnegie Steel Co., Illinois Steel Co., National Tube Co., Lorain Steel Co., Shelby Steel Tube Co., Tennessee Coal, Iron and Railroad Co., Trenton Iron Co.

MANUFACTURERS OF

Structural Steel for Every Purpose — Bridges, Railway and Highway — "Triangle Mesh" Wire Concrete Reinforcement — Plain and Twisted Reinforcing Bars — Plates, Shapes and Sheets of Every Description — Rails, Splice Bars, Bolts, Nuts, etc. — Wrought Pipe, Valves, Fittings, Trolley Poles — Frogs, Switches and Crossings for Steam Railway and Street Railway — "Shelby" Seamless Boiler Tubes and Mechanical Tubing—"Americore" and "Globe" Rubber Covered Wire and Cables — "Reliance" Weatherproof Copper and Iron Line Wire—"American" Wire Rope, Rail Bonds, Springs, Woven Wire Fencing and Poultry Netting — Tramways, etc.

United States Steel Products Co.

OFFICES AND WAREHOUSES AT

San Francisco - Los Angeles - Portland - Seattle

HERMAN T. LUDWIG
Building Construction
Phone Valencia 2539 636 Jessie Street, Near 7th, San Francisco

GEO. W. BOXTON & SON
General Contractors
Office, 1233 HEARST BUILDING SAN FRANCISCO, CAL.
Telephone Sutter 1601

Phone Kearny 381 J. M. Morrison F. H. Masow
MASOW & MORRISON
GENERAL CONTRACTORS
BUILDING CONSTRUCTION
518-522 Monadnock Bldg. San Francisco

Res. Mill Valley, Telephone Mill Valley 240 Member of General Contractors Association
HARVEY A. KLYCE
GENERAL BUILDING CONTRACTOR
408 New Call Building, SAN FRANCISCO Phone Douglas 3280

"LENNIG SYSTEM"
ELECTRIC HEATING RADIATOR with Automatic Temperature Control
The THERMOSTAT and THERMOPILE are only sold to Manufacturers and the Trade. Not at retail and not to be installed by this company.
Contractors and Dealers in Plumbing and Heating Goods—Ask for detailed information. Our proposition will interest you.
THERMIC ENGINEERING COMPANY *CLAUS SPRECKELS BUILDING, SAN FRANCISCO*

MacRORIE-McLAREN CO.
LANDSCAPE ENGINEERS and GENERAL NURSERYMEN
Office, 141 POWELL STREET, San Francisco
Nurseries at Beresford, San Mateo County

Phone Sutter 2581
LARSEN-SAMPSON CO.
BUILDING CONSTRUCTION
601 CROCKER BUILDING SAN FRANCISCO

GEO. FARRELL, BURLINGAME
Res. Phone Burlingame 1045
W. N. REED, 239 PRECITA AVE.
Res. Phone Valencia 6020
FARRELL & REED
CONTRACTORS
ROOM 334
BUILDERS' EXCHANGE
Telephone Sutter 450
185 STEVENSON STREET
SAN FRANCISCO

What Enamel Do You Specify?

Every architect pays particular attention to the quality of the finish produced with the enamel he has specified. For that reason he will specify only an enamel in which he has confidence and which he knows is dependable and durable.

Silkenwhite Enamel

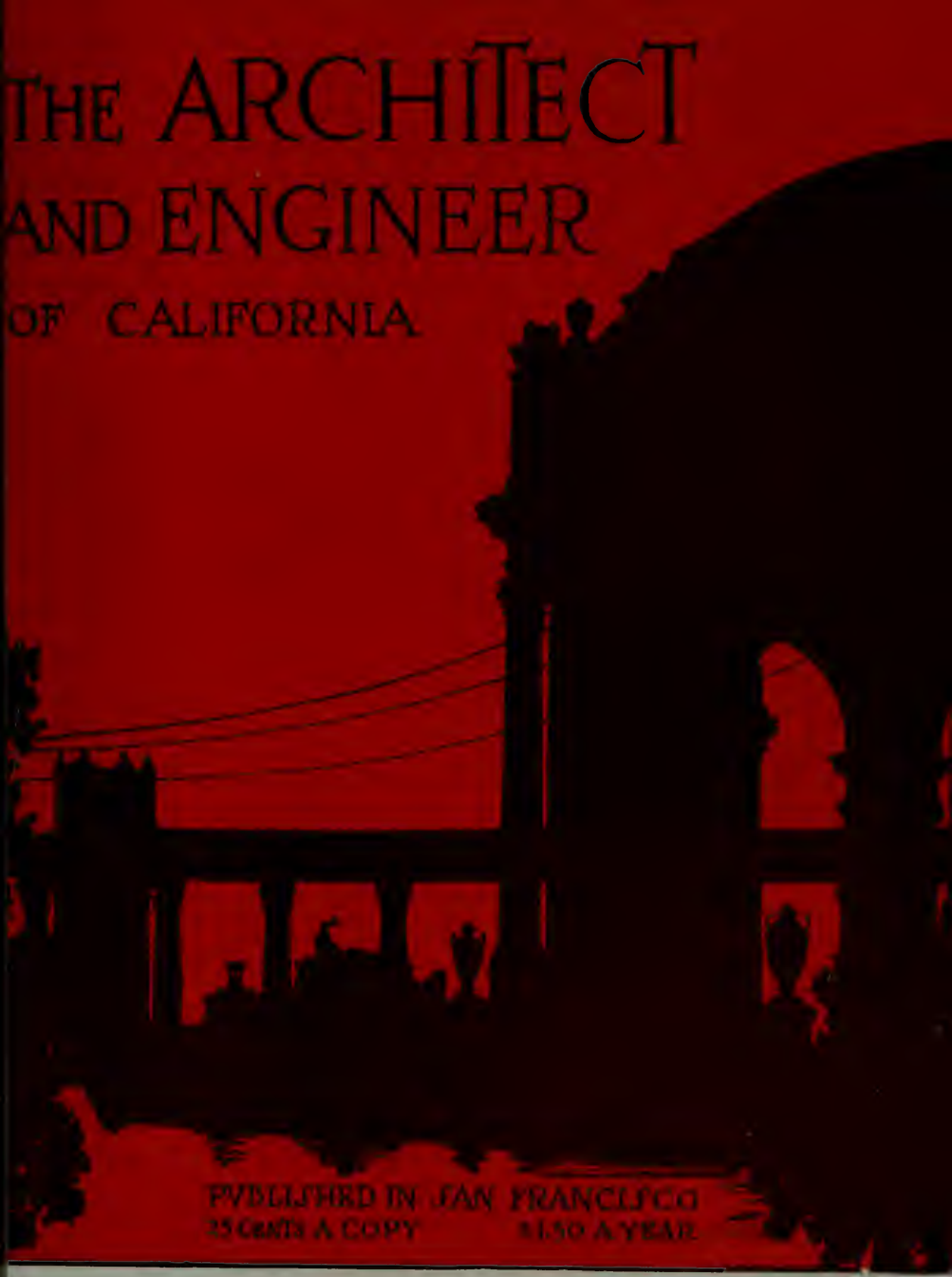
is the choice of many of the foremost architects in the West; — this is to be expected since an architect who specifies it is assured of an enamel finish to which he may point with pride for years to come.

MANUFACTURED BY

W. P. Fuller & Co.

Specialized Paint and Varnish Products For Every Purpose

THE ARCHITECT AND ENGINEER OF CALIFORNIA



PUBLISHED IN SAN FRANCISCO
25 CENTS A COPY $1.50 A YEAR

NOVEMBER 1917

This is the new trade mark which will appear upon all **PACIFIC** Plumbing Fixtures.

It denotes that the fixture is of superior quality and is guaranteed forever against any defects in workmanship or materials.

PACIFIC

PLUMBING FIXTURES

FOR SALE BY ALL JOBBERS

Main Offices and Showroom,
67 NEW MONTGOMERY ST.
SAN FRANCISCO,
CALIFORNIA

Branch Offices,
PORTLAND and
LOS ANGELES

Factories,
RICHMOND and
SAN PABLO,
CALIFORNIA

THIS **Factory, Warehouse and Office Building** for the Workman Packing Company, designed by Architect Smith O'Brien, is now under construction in San Francisco and will be equipped with

HAUSER REVERSIBLE WINDOWS

Factory and Office:

157 Minna Street, San Francisco **Phone Kearny 3706**

For Modern Store-Fronts

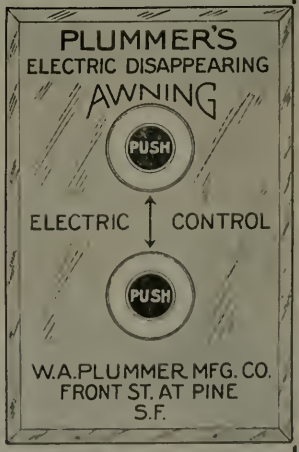
Our Disappearing AWNINGS

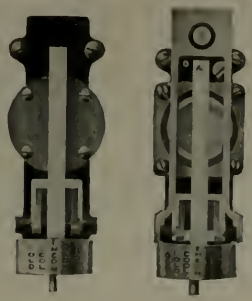
are constructed with no outside attachments below recess, above windows gears entirely concealed.

Absolutely practicable when extended and when rolled up is contained in recess 8" x 8½", with front board, which can be utilized as a sign board, covering front of recess. Operated either by crank or electric control, from any part of building.

Send for Architect's Sheet of Specifications.

The new Southern Pacific Building, San Francisco, is being equipped with **Plummer's Disappearing Awnings**





The Above Types of THERMOSTATS for VENTILATION and DIRECT RADIATION Respectively, are less than five inches long and represent

JOHNSON (Heat / Humidity) CONTROL

Write us about them

JOHNSON SERVICE CO.

800 Chamber of Commerce Bldg., Portland, Ore.
1104 White Building, Seattle, Wash.
604 Citizens Bank Bldg., Los Angeles, Cal.
149 FIFTH ST., SAN FRANCISCO, CAL.

THE PERFECTION DISAPPEARING BEDS

The Last Word in Efficiency, Simplicity and Adaptability

Full Line of Oscillating Beds, Disappearing Beds, Recess Beds, Wall Beds

PERFECTION DISAPPEARING BED CO.

Telephone Sutter 3367

739 Mission Street, San Francisco

THE HYLOPLATE BLACKBOARD

SCHOOL FURNITURE
Auditorium Seating

MAPS
GLOBES
ATLASES

C. F. WEBER & CO.

365 Market Street
SAN FRANCISCO

222-224
S. Los Angeles St.
LOS ANGELES

100 W. Commercial
Row, RENO, NEV.

124 W. Washington
Street, PHOENIX, ARIZ.

FOXCROFT BUILDING, 68 Post Street, San Francisco. Offices Single and in Suite.

Typical Holbrook, Merrill & Stetson Bath Room, which may be seen under pressure at their Uptown Display Room, 61 Sutter street, San Francisco.

GOOD PLUMBING is as essential to a Building as a Watertight Roof or a Substantial Foundation. Good Plumbing means Comfort, Health, Refinement. When an Architect specifies HOLBROOK, MERRILL & STETSON Plumbing he knows his Client will enjoy all these benefits and he has the further assurance that back of the goods is a guarantee of *Quality* that has been a trade-mark with this firm since the days of the Pioneer.

HOLBROOK, MERRILL & STETSON

DEALERS IN

PLUMBERS' SUPPLIES, IRON PIPE AND FITTINGS, METALS
STEAM, WATER AND HOT AIR HEATING APPARATUS
STOVES, RANGES AND KITCHEN UTENSILS

Main Office and Warehouse
SIXTH, TOWNSEND AND BLUXOME STREETS, SAN FRANCISCO

Walls finished with Cabot's Old Virginia White
Roof finished with No. 510 Dark Gray Creosote Stain
Walter Boschen Architect, St. Joseph, Mo.

The Latest Country-house Color-schemes

An especially appropriate and harmonious exterior color-treatment has been developed for the dignified and beautiful type of country-house that our leading architects have now firmly established, in place of the fifty-seven varieties that have prevailed in recent years.

Cabot's Old Virginia White, for the walls

Cabot's Creosote Stains, in greens or dark gray, for the roofs

The soft, brilliant "whitewash white" of the Old Virginia White is particularly suitable for this type of house, and the rich greens and velvety dark gray stains harmonize perfectly for the roof, with the old New England dark green blinds.

Samples and information sent on request

SAMUEL CABOT, Inc., Mfg. Chemists, Boston, Mass.

Cabot's Creosote Stains, Stucco and Brick Stains, "Quilt," Mortar Colors, Dampproofing, Waterproofings, Conservo Wood Preservative, etc.

Pacific Building Materials Co., San Francisco
Mathews Paint Company, Los Angeles
S. W. R. Daily, Seattle
Timms, Cress & Co., Portland

COURTEOUS CONTINUOUS RELIABLE
PACIFIC GAS AND ELECTRIC COMPANY

GAS IS THE CLEANEST AND

MOST EFFICIENT FUEL

A MATCH AND

"PACIFIC SERVICE"

WILL GIVE YOU

CONTINUOUS SERVICE

Pacific Gas and Electric Company

San Francisco District
445 Sutter Street, San Francisco, Cal.

"Standard" CONTRIBUTION TO PACIFIC COAST DEVELOPMENT

From the early days until the present, **"Standard"** PLUMBING FIXTURES have been a large factor in the building of the West.

Seven hundred and fifty carloads have been our annual contribution to the permanent built-in comfort and convenience in the Homes, Hotels, and Apartments of the Coast States, equalling the entire output of some enameling plants.

"Standard" is the largest make of plumbing fixtures used here.

"Standard" has standard-ized plumbing specifications.

We believe these facts entitle us to the friendly consideration of all architects, especially those who may not yet be fully acquainted with our service and personnel.

Our warehouses in San Francisco and Los Angeles contain large stocks of all popular patterns. Our Representatives have expert knowledge of plumbing requirements and are subject to your call.

Every **"Standard"** Plumbing Fixture represents 40 years of manufacturing experience and international prestige.

If you favor Home talent and investment, if you have a sentimental preference for the pioneer Pacific Coast enterprises and appreciate Quality, Service and Prestige, you will specify **"Standard"** Plumbing Fixtures.

Standard Sanitary Mfg. Co.

WAREHOUSES AND DISPLAY ROOMS

SAN FRANCISCO
149 Bluxome Street

LOS ANGELES
871 Mesquit Street

SEND FOR PRICE LIST
CLAY PRODUCTS
GLADDING, McBEAN & Co.
PERMANENT PIPE FOR IRRIGATION DRAINAGE CULVERTS SEWERAGE
CROCKER BLDG. SAN FRANCISCO
WORKS—LINCOLN, CAL.

RAYMOND GRANITE COMPANY
Incorporated
Owning and operating at Knowles, Madera County, the largest Quarry in the world,
CONTRACTORS FOR STONE WORK
OF EVERY DESCRIPTION
Designers and Manufacturers of Exclusive Monuments and Mausoleums.
Main Office and Yard:
Number 1 and 3 Potrero Avenue, - SAN FRANCISCO, CALIFORNIA.
Also at Number 612-614 Homer Laughlin Building, Los Angeles.

QUALITY SAND & ROCK CO.
Successor to SARATOGA CRUSHED ROCK COMPANY
and BAKER-MACDONALD CO.
CONCRETE ROCK AND CLEAN SHARP SAND
Crushed, Washed and Screened and in any size desired
SPECIALLY PREPARED SELF-BINDING ROCK
LOW FREIGHT RATE TO POINTS ON PENINSULAR RAILWAY
400—CUNARD BLDG., SAN FRANCISCO
Phone Douglas 2748
Quarry: Saratoga, Santa Clara Co.
703 First National Bank Building, SAN JOSE. Phone S.J.4620

S. F. Metal Stamping Works
THEOPHILE LAHAYE
ORNAMENTAL and PLAIN
Stamped, Spun, Hammered and Cast METAL
2269 FOLSOM ST. Phone Mission 2421 SAN FRANCISCO

Architects' Specification Index

(For Index to Advertisements, see next page)

ARCHITECTURAL SCULPTORS, MODELING, ETC.

G. Rognier & Co., 233 R. R. Ave., San Mateo.

ARCHITECTURAL TERRA COTTA

Gladding, McBean & Company, Crocker Bldg., San Francisco.

Los Angeles Pressed Brick Company and United Materials Company, Crossley Building, San Francisco.

ASBESTOS ROOFING

Asbestos Protected Metal Co., Hobart Bldg., San Francisco.

AUTOMATIC SPRINKLERS

Scott Company, 243 Minna St., San Francisco.

Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

AWNINGS

W. A. Plummer Mfg. Co., Pine and Front Sts., San Francisco.

BANK FIXTURES AND INTERIORS

Fink & Schindler, 218 13th St., San Francisco.

A. J. Forbes & Son., 1530 Filbert St., San Francisco.

C. F. Weber & Co., 365 Market St., San Francisco.

Home Mfg. Co., 543 Brannan St., San Francisco.

Rueker-Fuller Desk Co., 677 Mission St., San Francisco.

BLACKBOARDS

C. F. Weber & Co., 365 Market St., San Francisco, Los Angeles and Reno, Nevada.

Beaver Blackboards and Greenboards, Rueker-Fuller Desk Company, Coast agents, 677 Mission St., San Francisco, Oakland and Los Angeles.

BLOCK PAVING

California Redwood Association, Call-Post Bldg., San Francisco.

BOOK BINDERS AND PRINTERS

Hicks-Judd Company, 51-65 First St., San Francisco.

BRASS GOODS, CASTINGS, ETC.

H. Mueller Manufacturing Co., 589 Mission St., San Francisco.

BRICK—PRESSED, PAVING, ETC.

Gladding, McBean & Company, Crocker Bldg., San Francisco.

Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

Livermore Brick Company, pressed, glazed and enameled, etc., Livermore, Cal.

United Materials Co., Crossley Bldg., San Francisco.

California Brick Company, Niles, Cal.

BRICK AND CEMENT COATING

Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

Wadsworth, Howland & Co., Inc. (See Adv. for Pacific Coast Agents.)

Paraffine Paint Co., 34 First St., San Francisco.

R. N. Nason & Co., 151 Potrero Ave., San Francisco.

BRICK STAINS

Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

BUILDERS' HARDWARE

Bennett Bros., agents for Sargent Hardware, 514 Market St., San Francisco.

Pacific Hardware & Steel Company, San Francisco, Oakland, Berkeley, and Los Angeles.

Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.

BUILDING MATERIAL, SUPPLIES, ETC.

Pacific Building Materials Co., 523 Market St., San Francisco.

C. Jorgensen, Crossley Bldg., San Francisco.

The Howard Company, First and Market Sts., Oakland.

CEMENT

Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market street, San Francisco.

"Golden Gate" Brand, manufactured by Pacific Portland Cement Co., Pacific building, San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT

Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See distributing agents in advertisement.)

Armorite, sold by W. P. Fuller & Co., all principal Coast cities.

Imperial Waterproofing, manufactured by Imperial Co., Monadnock Bldg., San Francisco.

Paraffine Paint Co., 34 First St., San Francisco.

CEMENT EXTERIOR FINISH

Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co., (See list of Distributing Agents in adv.)

Concreta, sold by W. P. Fuller & Co., all principal Coast cities.

Telephone DOUGLAS 4109

GRACE & BERNIERI

GENERAL CONTRACTORS

511-513 Claus Spreckels Bldg. SAN FRANCISCO, CAL.

An Index to the Advertisements

	Page
American Mail Chute	30
American Marble & Mosaic Co.	36
American Rolling Mill	125
Arlett, Arthur	144
Asbestos Protected Metal Co.	117
Atkinson Window	133
Atlas Heating & Ventilating Co.	128
Austin Cube Mixer	136
Aylsworth Agencies Co	13
Bacon, Ed. R	121
Baker-MacDonald Co	6
Barrett & Hilo	128
Bass-Hueter Co	3rd Cover
Bender Roofing Co	128
Bennett Bros	141
Bergren & Son, L. G	123
Berry Bros	141
Bigley, Albert S	30
Biturine Company	36
Boggs, Fred H	143
Bos, Geo. A	145
Bowser & Co., S. F	135
Boxton & Son, Geo. W	147
Brininstool Co	22
Brunswick-Balke-Collender Co.	135
Building Material Exhibit	26
Burlington Venetian Blind Co.	34
Butte Engineering Co	115
Buttonlath	20
Cabot, Samuel (Inc.)	4
California Artistic Metal and Wire Co	32
California Brick Co	19
California Bldg. Material Co.	136
California Glass Brick Co	139
California Granite Co	141
California Hydraulic Engineering and Supply Co	123
California Photo Engraving Co.	140
California Plumbing Supply Co.	18
California Redwood Ass'n	130
California Seed Co	16
Cannon-Phillips Co	21
Capitol Art Metal Co	138
Carnahan & Mulford	128
Central Iron Works	32
Childs, Neil T	124
City of Paris	117
Coleman, Alex	140
Cook Belting Co	136
Costello, J. T. Co	143
Courtney, G. W	123
Cowell Lime & Cement Co	136
Crane Co	31
Crowe, J. B	123
Cutler Mail Chute Co	30
Denison Block Co	21
Detroit Steel Products	23
Dieckmann Hardwood Co	120
Dolan Wrecking and Construction Co	128
Dudfield Lumber Co	15
Duncan, W. C	140
Dunn, Neil H	123
Dyer Bros	22
Eaton, W. L	11
Elam & Son	141
Electrical Construction Co.	117
Ellery Arms Co	134
Fair Manufacturing Company	32
Falvy, A	34
Farrell & Reed	147
Fenestra Steel Sash	23
Fess System Co	34
Fick Bros	130
Fidelity & Casualty Co. of N.Y.	143
Fidelity & Deposit Co. of Maryland	143
Fink & Schindler Co., The	138
Fish Fuel System	144
Flagg, Edwin H., Scenic Co	141
Forbes & Son	134
Foxcroft Bldg	2
Fuller, W. P. Co	148
General Gas Light Co	24
Germanwood Floor Co	123
Gerow, B. V	133
Gilley-Schmid Co	140
Gladding, McBean & Co	6
Glauber Brass Mfg. Co	18
Globe Indemnity Co	143
Goffette Sales Ass'n	132
Goldberg, Bowen & Co	142
Golden Gate Decorating Co	134
Golden Gate Ornamental Iron Co	32
Goold & Johns	117
Grace & Bernieri	7
Grant Rock & Gravel Co	138
Haines, Jones & Cadbury	128
Hammond, M. E	18
Hannah, J. D	145
Hauser Reversible Window	1
Hicks-Judd Co	139
Hillard, C. J., Co	33
Hipolito Screen Co	34
Holbrook, Merrill & Stetson	3
Home Mfg. Co	141
Hooper Lumber Co	35
Houghton Construction Co	145
Howard Company	123
Hughson & Merton Co	140
Hunt, Robt. W. & Co	121
Hunter & Hudson	133
Hurley Co., J. C	138
Ideal Heating Co	117
Illinois Engineering Co	35
Imperial Waterproofing Co	28
Improved Sanitary Fixture Co.	23
Jackson Sidewalk Lights	14
James & Drucker	133
Jarvis, T. P	35
Johnson Service Co	2
Joost Brothers	131
Jorgensen, C	32
Judson Mfg. Co	31
Kinnear Mfg. Co	36
Kissel, I. R	138
Klyce, Harvey A	147
Knowles & Mathewson	141
Lange & Bergstrom	144
Larsen & Bro	128
Larsen, Sampson & Co	147
Lawton & Vezey	143
Lettich, A	141
Livermore Fire Brick Works	19
Los Angeles Pressed Brick Co.	29
Ludwig, H. T	147
MacGruer & Co	138
Magner Bros	134
Mark-Lally Co	133
Mason & Morrison	147
Mangrum & Otter	130
Marshall & Stearns Co	22
Master Builders	120
McElhinney Tile Co	12
McGilvray Stone Co	133
MacRorie-McLaren Co	147
Meese & Gottfried	124
Miller-Enwright Co	138
Montague, P	145
Morehouse, C. C	144
Mortenson Construction Co	32
Mott Iron Works	18
Mueller, H., Mfg. Co	133
Municipal Engineering Co	136
Musto Sons Keenan Co	13
Nason, R. N. & Co	12
Nathan, Dohrmann Co	140
National Mill & Lumber Co.	17
National Surety Co	134
Ne Page, McKenny Co	117
Newbery Electric Co	117
New York Belting Co	129
Niles Sand Gravel & Rock Co.	36
Norris Co., L. A	139
O'Hara & Livermore	119
Oak Flooring Service Bureau	25
Otis Elevator Co.	Back Cover
Owsley, Burt	147
Pacific Building Materials Co.	31
Pacific Coast Paint Corp'n	142
Pacific Coast Steel Company	27
Pacific Fire Extinguisher Co	115
Pacific Gas & Electric Co	4
Pacific Hardware and Steel Co.	140
Pacific Imp. Co	17
Pacific Mfg. Co	141
Pacific Porcelain Ware Co.	2d Cover
Pacific Rolling Mills	33
Palm Iron Works	31
Palmer & Petersen	145
Paraffine Paint Co.	Back Cover
Perfection Disappearing Bed Co	2
Patent Vulcanite Roofing Co.	14
Phillips, Chas. T	124
Phoenix Sidewalk Light	9
Pioneer Paper Co	9
Pitcher Door Hanger	17
Pittsburg Water Heater	21
Plummer, W. A. Mfg. Co	1
Pope & Talbot	15
Portland Lumber Co	15
Prometheus Electric Co	18
Quality Sand and Rock Co	6
Ralston Iron Works	33
Ray, W. S. Mfg. Co. Inc	27
Raymond Granite Co	6
Reliance Ball-Bearing Door Hanger	130
Rigney Tile Co	134
Rix Compressed Air Co	23
Roberts Mfg. Co	115
Robertson & Hall	143
Rognier & Co	24
Rucker-Fuller Desk Co	140
Sartorius Company, Inc	23
S. F. Metal Stamping Works	6
S. F. Pioneer Varnish Wks.	3d Cover
Schaw-Batcher Co	132
Scott Co	128
Schreiber & Sons Co	30
Schrader Iron Works	32
Sierra Electric Constr. Co	115
Simonds Machinery Co	134
Simpson & Stewart	34
Sloan Valve Co	25
Snook Company	35
Southern California Iron and Steel Co	27
Southern Pacific Co	142
Spencer Elevator Co	11
Spencer Turbine Cleaner	140
St. Francis Hotel	26
Standard Sanitary Mfg. Co	5
Standard Varnish Co	137
Stockholm & Allyn	143
Strable Mfg. Co	127
Sunset Lumber Company	15
Thermic Eng. Co	117
Tittle, H. S	134
Tormey Co	133
Uhl Bros	118
United Materials Co	29
U. S. Metal Products Co	21
U. S. Steel Products Co	146
Van Fleet-Freear Co	10
Vermont Marble Co	24
Vogt, Alf. H	145
Wadsworth Howland	116
Ward, P. R	123
Walter, D. N. & E. & Co	10
Weber, C. P. & Co	2, 10
West Coast Wire & Iron Works	32
Western Blind & Screen Co.	20
Western Iron Works	33
Western Pacific	142
Western Vacuum Supply Co.	121
Whitcomb Hotel	24
White Bros. & Co	114
Wilson, W. P., Co	138
Wold, C. L., Co	145
Woods, Huddart & Gunn	27
Zelinsky, D. & Sons	145

Roofing?
Don't take chances on inferior material. Buy the old reliable **Pioneer**
SPECIFY AND INSIST ON "PIONEER ROOFING"
PIONEER PAPER CO., Manufacturers **506-507 Hearst Bldg., San Francisco** Telephone Kearny 3788

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CEMENT EXTERIOR FINISH—continued

Pacific Building Materials Co., 523 Market St.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING

Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents in adv.)
Fuller's Concrete Floor Enamel, made by W. P. Fuller & Co., San Francisco.

CEMENT TESTS—CHEMICAL ENGINEERS

Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CHURCH INTERIORS

Fink & Schindler, 218 13th St., San Francisco.

CHUTES—SPIRAL

Haslett Warehouse Co., 310 California St., San Francisco.

COLD STORAGE PLANTS

T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

COMPOSITION FLOORING

Germanwood Floor Co., 1621 Eddy St., San Francisco.

COMPRESSED AIR CLEANERS

Spencer Turbine Cleaner. Sold by Hughson & Merton, 530 Golden Gate Ave., San Francisco.
Western Vacuum Supply Co., 1125 Market St., San Francisco.

CONCRETE CONSTRUCTION

Clinton Construction Co., 140 Townsend street, San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Palmer & Petersen, Monadnock Bldg., San Francisco.

CONCRETE HARDNER

Master Builders Method, represented in San Francisco by C. Roman, Sharon Bldg.
Goffette Sales Association, 276 Monadnock Bldg., San Francisco.

CONCRETE MIXERS

Austin Improved Cube Mixer. J. H. Hansen & Co., California agents, 508 Balboa Bldg., San Francisco.
Foote Mixers. Sold by Edw. R. Bacon, 40 Natoma St., San Francisco.

CONCRETE REINFORCEMENT

United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Twisted Bars. Sold by Woods, Huddart & Gunn, 444 Market St., San Francisco.
Clinton Welded Wire Fabric, L. A. Norris Co., 140 Townsend St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Southern California Iron and Steel Company, Fourth and Mateo Sts., Los Angeles.

CONCRETE REINFORCEMENT—Continued.

Triangle Mesh Fabric. Sales agents, Pacific Building Materials Co., 523 Market St., San Francisco.

CONCRETE SURFACING

"Concreta." Sold by W. P. Fuller & Co., San Francisco.
Wadsworth, Howland & Co.'s Bay State Brick and Cement Coating. Sold by Jas. Hambly & Sons, Pacific Bldg., San Francisco and Los Angeles.

CONTRACTOR'S BONDS

Bonding Company of America, Kohl Bldg., San Francisco.
Globe Indemnity Co., 120 Leidesdorff St., San Francisco.
Fred H. Boggs, Foxcroft Bldg., San Francisco.
National Surety Co. of N. Y., 105 Montgomery St., San Francisco.
Fidelity & Casualty Co. of New York, Merchants Exchange Bldg., San Francisco.
Fidelity & Deposit Co. of Maryland,, Insurance Exchange, San Francisco.
J. T. Costello Co., 216 Pine St., San Francisco.
Robertson & Hall, First National Bank Bldg., San Francisco.

CONTRACTORS, GENERAL

Farrell & Reed, 183 Jessie St., San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Carnahan & Mulford, 45 Kearny St., San Francisco.
Houghton Construction Co., Flatiron Bldg., San Francisco.
Geo. H. Bos, Hearst Bldg., San Francisco.
Larsen, Sampson & Co., Crocker Bldg., San Francisco.
J. D. Hannah, 725 Chronicle Bldg., San Francisco.
Stockholm & Allyn, Monadnock Bldg., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
L. G. Bergren & Son, Call Bldg., San Francisco.
Grace & Bernieri, Claus Spreckels Bldg., San Francisco.
Geo. W. Boxton & Son, Hearst Bldg., San Francisco.
W. C. Duncan & Co., 526 Sharon Bldg., San Francisco.
Harvey A. Klyce, New Call Bldg., San Francisco.
Knowles & Mathewson, Call Bldg., San Francisco.
C. L. Wold Co., 75 Sutter St., San Francisco.
P. R. Ward, 981 Guerrero St., San Francisco.
Lange & Bergstrom, Sharon Bldg., San Francisco.
Alfred H. Vogt, 231 Builders Exchange Bldg., San Francisco.
T. B. Goodwin, 110 Jessie St , San Francisco.
Thos. Flam & Son, Builders Exchange, San Francisco.
Masow & Morrison, 518 Monadnock Bldg., San Francisco.
Lawton & Vezey, 206 Plaza Bldg., Oakland.

PHŒNIX SIDEWALK LIGHTS
ARE INSTALLED at the Santa Fe Building,
Second and Market Streets, San Francisco
PHŒNIX SIDEWALK LIGHT CO.
472 Monadnock Building, SAN FRANCISCO Telephone Douglas 3111

MAS-OLEUM FLOORING (A Mastic Linoleum)
DUSTLESS, SEAMLESS, WATERPROOF, ACID and ALKALI PROOF
VAN FLEET - FREEAR COMPANY, Agents
Telephone Douglas 1227 120 JESSIE STREET, SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONVEYING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CORK TILING, FLOORING, ETC.
Bevver Cork Tile. Sold by W. L. Eaton & Co., 812 Santa Marina Bldg., San Francisco.
Van Fleet-Freear Company, 120 Jessie St., San Francisco.

CORNER BEAD
Capitol Art Metal Works, Call-Post Bldg., San Francisco.
United States Metal Products Co., 555 Tenth St., San Francisco; 750 Keller St., San Francisco.

CORK TILE AND INSULATION
Van Fleet-Freear Co., 120 Jessie St., San Francisco.

CRUSHED ROCK
Grant Gravel Co., Flatiron Bldg., San Francisco.
California Building Material Company, new Call Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., San Francisco.
Quality Sand & Rock Co., 400 Cunard Bldg., San Francisco.

DAMP-PROOFING COMPOUND
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Biturine Co., 24 California St., San Francisco.
Imperial Co., Monadnock Bldg., San Francisco.
"Pabco" Damp-Proofing Compound, sold by Paraffine Paint Co., 34 First St., San Francisco.
Wadsworth, Howland & Co., Inc., 84 Washington St., Boston. (See Adv. for Coast agencies.)

DOOR HANGERS
McCabe Hanger Mfg. Co., New York, N. Y.
Pitcher Hanger, sold by National Lumber Co., 326 Market St., San Francisco.
Reliance Hanger, sold by Sartorius Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Columbia Wire & Iron Works, Portland, Ore.

DRAIN BOARDS, SINK BACKS, ETC.
Germanwood Floor Co., 1621 Eddy St., San Francisco.

DRINKING FOUNTAINS
Haws Sanitary Fountain, 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 173 Beale St., San Francisco.
M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELECTRICAL CONTRACTORS
Butte Engineering Co., 683 Howard St., San Francisco.
Goold & Johns, 113 S. California St., Stockton, Cal.
NePage, McKenny Co., 149 New Montgomery St., San Francisco.
Newbery Electrical Co., 413 Lick Bldg., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
H. S. Tittle, 245 Minna St., San Francisco.
Standard Electrical Construction Company, 60 Natoma St., San Francisco.

ELECTRICAL ENGINEERS
Chas. T. Phillips, Pacific Bldg., San Francisco.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 126 Beale St., San Francisco.

ENGINEERS
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

FIRE ESCAPES
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE EXTINGUISHERS
Scott Company, 243 Minna St., San Francisco
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

FIREPROOFING AND PARTITIONS
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

FIXTURES—BANK, OFFICE, STORE, ETC.
T. H. Meek & Co., 1130 Mission St., San Francisco.
The Fink & Schindler Co., 218 13th St., San Francisco.
A. J. Forbes & Son, 1530 Filbert St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

D. N. & E. WALTER & CO.
"SINCE 1858"
LINOLEUMS—CARPETS LARGE STOCKS CARRIED
Estimates furnished on request
100 STOCKTON STREET SAN FRANCISCO

"BE-VER" CORK TILING

Artistic = Quiet = Durable
MADE IN A WIDE RANGE OF COLORS — MODERATE IN PRICE
W. L. EATON & CO., Agents
112 Market St., San Francisco Telephone Garfield 372
See sample installation at The Building Material Exhibit, 77 O'Farrell Street

ARCHITECTS' SPECIFICATION INDEX—*Continued*

FLOOR TILE
New York Belting and Packing Company, 519 Mission St., San Francisco.
W. L. Eaton & Co., 112 Market St., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Berry Bros., 250-256 First St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
R. N. Nason & Co., San Francisco and Los Angeles.

FLOORS—COMPOSITION
"Vitrolite," for any structure, room or bath. Vitrolite Construction Co., 1490 Mission St., San Francisco.
Germanwood Floor Co., 1621 Eddy St., San Francisco.

FLOORS—HARDWOOD
Oak Flooring Bureau, Conway Bldg., Chicago, Ill.
Strable Mfg. Co., 511 First St., Oakland.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.

FURNACES—WARM AIR
Miller-Enwright Co., 907 Front St., Sacramento.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co., 612 Howard St., San Francisco.
Rix Compressed Air and Drill Company, First and Howard Sts., San Francisco.

GARBAGE CHUTES
Bradshaw Sanitary Garbage Chute, Aylsworth Agencies Co., 591 Mission St., San Francisco, sole agents for California.

GAS GRATES
General Gas Light Co., 768 Mission St., San Francisco.

GLASS
W. P. Fuller & Company, all principal Coast cities.

GLASS BRICK
California Glass Brick Co., 228 Grant Ave., San Francisco.

GRADING, WRECKING, ETC.
P. Montague Co., 110 Jessie St., San Francisco.
Dolan Wrecking & Construction Co., 1607 Market St., San Francisco

GRANITE
California Granite Co., Sharon Bldg., San Francisco.
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.
McGilvray Raymond Granite Company, 634-666 Townsend St., San Francisco.

GRAVEL AND SAND
California Building Material Co., new Call Bldg., San Francisco.
Del Monte White Sand, sold by Pacific Improvement Co., Crocker Bldg., San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
Grant Rock & Gravel Co., Cory Bldg., Fresno.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., 704 Market St., San Francisco.
Quality Sand & Rock Co., 400 Cunard Bldg., San Francisco.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.
Empire Plaster sold by Pacific Portland Cement Co., Pacific Bldg., San Francisco.

HARDWARE
Joost Bros., agents for Russell & Erwin hardware, 1053 Market St., San Francisco.
Pacific Hardware & Steel Company, representing Lockwood Hardware Co., San Francisco.
Sargent's Hardware, sold by Bennett Bros., 514 Market St., San Francisco.

HARDWOOD LUMBER—FLOORING, ETC.
Dieckmann Hardwood Co., Beach and Taylor Sts., San Francisco.
Parrott & Co., 320 California St., San Francisco.
White Bros., cor. Fifth and Brannan Sts., San Francisco.
Strable Mfg. Co., 511 First St., Oakland.

HEATERS—AUTOMATIC
Pittsburg Water Heater Co., 478 Sutter St., San Francisco.

HEATING AND VENTILATING
Gilley-Schmid Company, 198 Otis St., San Francisco.
Mangrum & Otter, Inc., 507 Mission St., San Francisco.
Charles T. Phillips, Pacific Bldg., San Francisco.
James & Drucker, 450 Hayes St., San Francisco.
J. C. Hurley Co., 509 Sixth St., San Francisco.
Illinois Engineering Co., 563 Pacific Bldg., San Francisco.
Neil H. Dunn, 786 Ellis St., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
Scott Company, 243 Minna St., San Francisco.

HEAT REGULATION
Johnson Service Company, 149 Fifth St., San Francisco.

HOLLOW BLOCKS
Denison Hollow Interlocking Blocks. Cannan-Phillips Co., Forum Bldg., Sacramento, and the Howard Company, Oakland.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

MADE IN SAN FRANCISCO
PASSENGER and FREIGHT ELEVATORS
INVESTIGATE OUR PRODUCT
SPENCER ELEVATOR COMPANY
126-128 Beale Street, SAN FRANCISCO Phone Kearny 664

McELHINNEY TILE CO.

Contractors for

FLOOR, WALL AND MANTEL TILE

See Display at Building Material Exhibit

1097 Mission Street, San Francisco Park 6986

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HOSPITAL EQUIPMENT
Sierra Electric Construction Company, 619 Call Bldg., San Francisco.

HOSPITAL FIXTURES
J. L. Mott Iron Works, 135 Kearny St., San Francisco.

HOTELS
St. Francis Hotel, Union Square, San Francisco
Hotel Whitcomb, facing Civic Center, San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and Monadnock Bldg., San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INSURANCE
J. T. Costello Co., 216 Pine St., San Francisco.

INTERIOR DECORATORS
Albert S. Bigley, 344 Geary St., San Francisco.
City of Paris, Geary and Stockton Sts., San Francisco.
A. Palvy, 578 Sutter St., San Francisco.
The Tormey Co., 1042 Larkin St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
O'Hara & Livermore, Sutter St., San Francisco.

LANDSCAPE ARCHITECTS
Neil T. Childs Co., 68 Post St., San Francisco.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 135 Kearny St., San Francisco.
Ralston Iron Works, 20th and Indiana Sts., San Francisco.

LANDSCAPE GARDENERS
MacRorie-McLaren Co., 141 Powell St., San Francisco.

LATHING MATERIAL
"Buttonlath," manufactured by Buttonlath Mfg. Co., office, Building Material Exhibit, San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co., 445 Sutter St., San Francisco.
The Fish Fuel System, 50 Eighth St., San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
D. N. & E. Walter & Co., O'Farrell and Stockton Sts., San Francisco.

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.

LUMBER—Continued
Hooper Lumber Co., Seventeenth and Illinois Sts., San Francisco.
Portland Lumber Co., 16 California St., San Francisco.
Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
Pope & Talbot, foot of Third St., San Francisco.
Sunset Lumber Co., Oakland, Cal.
California Redwood Association, 723 Call-Post Bldg., San Francisco.

MAIL CHUTES
Cutler Mail Chute Co., Rochester, N. Y. (See adv. on page 30 for Coast representatives.)
American Mailing Device Corp., represented on Pacific Coast by Waterbouse-Wilcox Co., Monadnock Bldg. Arcade., San Francisco.

MANTELS
Mangrum & Otter, 561 Mission St., San Francisco.

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.

METAL CEILINGS
San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

METAL DOORS AND WINDOWS
U. S. Metal Products Co., 555 Tenth St., San Francisco.
Capitol Art Metal Works, New Call Bldg., San Francisco. Factory in Richmond.

METAL FURNITURE
Capitol Art Metal Works, New Call Bldg., San Francisco. Factory in Richmond.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.

MILL WORK
Dudfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218 13th St., San Francisco.

OIL BURNERS
American Standard Oil Burner Company, Seventh and Cedar Sts., Oakland.
S. T. Johnson Co., 1337 Mission St., San Francisco.
T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., San Francisco.
Fess System, 220 Natoma St., San Francisco.
W. S. Ray Mfg. Co., 218 Market St., San Francisco.

NASON'S OPAQUE FLAT FINISH A FLAT, WASHABLE OIL PAINT, made in soft Kalsomine tints—a practical article for WALLS, CEILINGS, Etc. Economical and Durable. Agency TAMM & NOLAN COMPANY'S high grade Varnishes and Finishes, made on the Pacific Coast to stand our climatic conditions.

R. N. NASON & CO., Paint Makers
151 Potrero Ave.—SAN FRANCISCO—54 Pine Street

PORTLAND
SEATTLE
LOS ANGELES

CLARENCE E. MUSTO, Pres. JOSEPH B. KEENAN, Vice-Pres. GUIDO J. MUSTO, Sec'y & Treas.

JOSEPH MUSTO SONS-KEENAN CO.

Phone Franklin —6365— **MARBLE**

OFFICE AND MILLS: 535-565 North Point St., SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE
- American Art Metal Works, 13 Grace St., San Francisco.
- California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
- Fair Manufacturing Company, 617 Bryant St., San Francisco.
- Palm Iron & Bridge Works, Sacramento.
- Ralston Iron Works, 20th and Indiana Sts., San Francisco.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
- Schreiber & Sons Co., represented by Western Builders Supply Co., San Francisco.
- Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
- West Coast Wire & Iron Works, 861-863 Howard St., San Francisco.

PAINT FOR CEMENT
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.) (See adv. in this issue for Pacific Coast agents.)
- Fuller's Concreta for Cement, made by W. P. Fuller & Co., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
- Berry Bros., 250-256 First St., San Francisco.
- Biturine Company, 24 California St., San Francisco.
- Pacific Coast Paint Corp'n, Security Bank Bldg., Oakland.
- Paraffine Paint Co., 34 First St., San Francisco.
- Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.

PAINTING, TINTING, ETC.
- Golden Gate Decorating Co., 704 Polk St., San Francisco.
- I. R. Kissel, 1747 Sacramento St., San Francisco.
- D. Zelinsky & Sons, San Francisco and Los Angeles.
- The Tormey Co., 681 Geary St., San Francisco.
- Fiek Bros., 475 Haight St., San Francisco.

PAINTS, OILS, ETC.
- The Brininstool Co., Los Angeles, the Haslett Warehouse, 310 California St., San Francisco.
- Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco.
- Berry Bros., 250-256 First St., San Francisco.
- Biturine Co., 24 California St., San Francisco
- Pacific Coast Paint Corp'n, Security Bank Bldg., Oakland.
- Magner Bros., 414-424 Ninth St., San Francisco.
- R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
- W. P. Fuller & Co., all principal Coast cities.
- Standard Varnish Works, 55 Stevenson St., San Francisco.

PANELS AND VENEER
- White Bros., Fifth and Brannan Sts., San Francisco.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA
- Gladding, McBean & Co., Crocker Bldg., San Francisco.

PLASTER CONTRACTORS
- C. C. Morehouse, Crocker Bldg., San Francisco.
- MacGruer & Co., 180 Jessie St., San Francisco

PLASTER EXTERIORS
- Buttonlath, for exterior and interior plastering, Hearst Bldg., San Francisco.

PLUMBING CONTRACTORS
- Alex Coleman, 706 Ellis St., San Francisco.
- A. Lettich, 365 Fell St., San Francisco.
- Neil H. Dunn, 786 Ellis St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Scott Co., Inc., 243 Minna St., San Francisco.
- Wm. F. Wilson Co., 328 Mason St., San Francisco.

PLUMBING FIXTURES, MATERIALS, ETC
- California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
- Crane Co., San Francisco and Oakland.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Glauber Brass Manufacturing Company, 1107 Mission St., San Francisco.
- Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
- Improved Sanitary Fixture Co., 632 Metropolitan Bldg., Los Angeles.
- J. L. Mott Iron Works, D. H. Gulick, selling agent, 135 Kearny St., San Francisco.
- Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
- H. Mueller Manufacturing Co., Pacific Coast branch, 589 Mission St., San Francisco.
- Miller-Enwright Co., 907 Front St., Sacramento.
- Mark-Lally Co., 235 Second St., San Francisco, also Oakland, Fresno, San Jose and Stockton.
- Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
- Standard Sanitary Mfg. Co., 149 Bluxome St., San Francisco.
- Wm. F. Wilson Co., 328 Mason St., San Francisco.
- Neil H. Dunn, 786 Ellis St., San Francisco.

POTTERY
- Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

POWER TRANSMITTING MACHINERY
- Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PUMPS
- Simonds Machinery Co., 117 New Montgomery St., San Francisco.

RAILROADS
- Southern Pacific Company, Flood Bldg., San Francisco.
- Western Pacific Company, Mills Bldg., San Francisco.

REFRIGERATORS
- McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton Sts., San Francisco.

B R A D S H A W

SANITARY GARBAGE CHUTE

For full particulars see

AYLSWORTH AGENCIES CO.

591 Mission St. San Francisco Tel., Douglas 4405

Jackson's Patent Sidewalk Lights
and "No Leak" Sidewalk Doors
FIRST AND BEST
P. H. Jackson & Co.
237 - 247 FIRST ST., SAN FRANCISCO
Tel. Kearny 1959

ARCHITECTS' SPECIFICATION INDEX—*Continued*

REVERSIBLE WINDOWS
Hauser Reversible Window Company, Balboa Bldg., San Francisco.

REVOLVING DOORS
Van Kennel Doors, sold by U. S. Metal Products Co., 525 Market St., San Francisco.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
C. F. Weber & Co., 365 Market St., S. F.
Kinnear Steel Rolling Door Co., Pacific Building Materials Co., 523 Market St., San Francisco.
Wilson's Steel Rolling Doors, Waterhouse-Wilcox Co., Monadnock Bldg. Arcade, San Francisco.

ROOFING AND ROOFING MATERIALS
Asbestos Protected Metal Company, Hobart Building, San Francisco.
Grant Gravel Co., Flatiron Bldg., San Francisco.
Niles Sand, Gravel and Rock Co., Mutual Bank Bldg., San Francisco.
"Malthoid" and "Ruberoid," manufactured by Paraffine Paint Co., San Francisco.
Pioneer Roofing, manufactured by Pioneer Paper Co., 513 Hearst Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.
Vulcanite Products—Vulcanite ornamental roofings and Vulcanite roofing shingles, sold by Patent Vulcanite Roofing Co., 16th and Texas Sts., San Francisco.

RUBBER TILING
New York Belting & Rubber Company, 519 Mission St., San Francisco.

SAFETY TREADS
"Sanitread," sold by Richard Spencer, 801-3 Hearst Bldg., San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.
C. Jorgensen, Crossley Bldg., San Francisco.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co., 365 Market St., San Francisco; 512 S. Broadway, Los Angeles.
Rucker-Fuller Desk Company, 677 Mission St., San Francisco.

SCREENS
Hipolito Flyout Screens, sold by Simpson & Stewart, Dalziel Bldg., Oakland.

SEEDS
California Seed Company, 151 Market St., San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Paraffine Paint Co., 34 First St., San Francisco.

SHEET METAL WORK, SKYLIGHTS, ETC.
Asbestos Protected Metal Company, Hobart Bldg., San Francisco.
Capitol Sheet Metal Works, New Call Bldg., San Francisco. Works in Richmond.
U. S. Metal Products Co., 555 Tenth St., San Francisco.

SHINGLE STAINS
Cabot's Creosote Stains, sold by Pacific Building Materials Co., Underwood Bldg., San Francisco
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SIDEWALK LIGHTS
P. H. Jackson & Co., 237-47 First St., San Francisco.
Phoenix Sidewalk Light Co., 472 Monadnock Bldg., San Francisco.

STEEL TANKS, PIPE, ETC.
Schaw-Batcher Co. Pipe Works, 356 Market St., San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Dyer Bros., 17th and Kansas Sts., San Francisco.
Golden Gate Iron Works, 1541 Howard St., San Francisco.
Judson Manufacturing Co., 819 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Southern California Iron and Steel Co., Fourth and Mateo Sts., Los Angeles.
Western Iron Works, 141 Beale St., San Francisco.

STEEL PRESERVATIVES
Bay State Steel Protective Coating, manufactured by Wadsworth, Howland Co. (See adv. for coast agencies.)
Paraffine Paint Co., 34 First St., San Francisco.
Biturine Company, 24 California St., San Francisco.

STEEL REINFORCING
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Southern California Iron & Steel Company, Fourth and Mateo Sts., Los Angeles; W. B. Kyle, San Francisco representative, Call Bldg.
Woods, Huddart & Gunn, 444 Market St., Sao Francisco.

STEEL ROLLING DOORS
Kinnear Steel Rolling Door Co., Rialto Bldg., San Francisco.

STEEL SASH
"Fenestra," solid steel sash, manufactured by Detroit Steel Products Company, Detroit, Mich.

REGISTERED PREPARED VULCANITE ROOFINGS TRADE MARK
VULCANITE ROOFINGS
including
ROLLS, SHINGLES and ORNAMENTAL EFFECTS
PATENT VULCANITE ROOFING COMPANY
San Francisco Depot, 16th and Texas Sts. Phone Market 390

LATH, SHINGLES, SHAKES and POSTS, SASH, DOORS and MILL WORK
TIMBERS and SPECIALS *KILN DRIED FINISH and FLOORING*

SUNSET LUMBER COMPANY
DEALERS WHOLESALE AND RETAIL IN
PINE and REDWOOD LUMBER

PHONE OAKLAND 1820
YARDS AND OFFICE
OAK AND FIRST STS., OAKLAND, CAL.

PORTLAND LUMBER CO.

Yards { TRACY, CAL. / BRENTWOOD, CAL.
Phone KEARNY 2074

PORTLAND LUMBER COMPANY
A. J. RUSSELL, Agent
LUMBER
SIMPLEX SILOS
SAGINAW SPECIAL SHINGLES
Ship Timbers, Oil Rigs and Special Bills Cut to Order.
16 California Street San Francisco, Cal.

Millwork Manufactured
and Delivered Anywhere
Plans or Lists sent us for Estimates will have Careful and Immediate Attention
DUDFIELD LUMBER CO.
Main Office, Yard and Planing Mill - PALO ALTO
JNO. DUDFIELD, President and Manager JOSEPH A. JURY, Secretary and Mill Supt.

POPE & TALBOT
Manufacturers, Exporters and Dealers in
Lumber, Timber, Piles, Spars, etc.
Office, Yards and Planing Mills
859-869 THIRD ST., SAN FRANCISCO, CAL.
Mills, Port Gamble, Port Ludlow and Utsalady, Washington

ARCHITECTS' SPECIFICATION INDEX—*Continued*

STEEL WHEELBARROWS
Champion and California steel brands, made by Western Iron Works, 141 Beale St., San Francisco.

STONE
California Granite Co., 518 Sharon Bldg., San Francisco.
McGilvray Stone Company, 634 Townsend St., San Francisco.
Raymond Granite Company, 1 and 3 Potrero St., San Francisco.

STORAGE SYSTEMS—GASOLINE, OIL, ETC.
S. F. Bowser & Co., 612 Howard St., San Francisco.
Rix Compressed Air and Drill Co., First and Howard Sts., San Francisco.

TELEPHONE AND ELECTRIC EQUIPMENT
Aylsworth Agencies Company, 591 Mission St., San Francisco.

TELEPHONE SIGNALS
Sierra Electric Construction Co., Call-Post Bldg., San Francisco.

TEMPERATURE REGULATION
Johnson Service Company, 149 Fifth St., San Francisco.

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market St., San Francisco.

TILES, MOSAICS, MANTELS, ETC.
Rigney Tile Company, Sheldon Bldg., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.
McElhinney Tile Co., 77 O'Farrell St., San Francisco.

TILE FOR ROOFING
Gladding, McBean & Co., Crocker Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

TILE WALLS—INTERLOCKING
Denison Hollow Interlocking Blocks, Forum Bldg., Sacramento.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

VACUUM CLEANERS
Palm Vacuum Cleaners, sold by Western Vacuum Supply Co., 1125 Market St., San Francisco.
Spencer Turbine Cleaner, sold by Hughson & Merton, 77 O'Farrell St., San Francisco.

VALVES
Sloan Royal Flush Valves. T. R. Burke, Pacific Coast agent, Wells Fargo Bldg., San Francisco.
Crane Radiator Valves., manufactured by Crane Co., Second and Brannan Sts., San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
Berry Bros., 250-256 First St., San Francisco.
W. P. Fuller Co., all principal Coast cities.
Pacific Coast Paint Corp'n, 112 Market St., San Francisco; Security Bank Bldg., Oakland.
R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
Standard Varnish Works, San Francisco.
S. F. Pioneer Varnish Works, 816 Mission St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
Burlington Venetian Blinds, Burlington, Vt., and C. F. Weber & Co., 365 Market St., San Francisco.
Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.

WALL BEDS, SEATS, ETC.
Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.
Perfection Disappearing Bed Co., 739 Mission St., San Francisco.

WALL BOARD
"Amiwud" Wall Board, manufactured by Paraffine Paint Co., 34 First St., San Francisco.

WALL PAINT
Nason's Opaque Flat Finish, manufactured by R. N. Nason & Co., San Francisco, Portland and Los Angeles.
San-A-Cote and Vel-va-Cote, manufactured by the Brininstool Co., Los Angeles.

WALL PAPER
Uhl Bros., 38 O'Farrell St., San Francisco.
The Tormey Co., 681 Geary St., San Francisco.

WATER HEATERS—AUTOMATIC
Pittsburg Water Heater Co. of California, 478 Sutter St., San Francisco, and 402 Fifteenth St., Oakland.

WATERPROOFING FOR CONCRETE, BRICK, ETC.
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Biturine Company, 24 California St., San Francisco.
Goffette Sales Corporation, Monadnock Bldg., San Francisco.
Imperial Co., 183 Stevenson St., San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Wadsworth, Howland & Co., Inc. (See adv. for Coast agencies.)

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL FINISH
"Gold Seal," manufactured and sold by Bass-Hueter Paint Company. All principal Coast cities.
"Silkenwhite," made by W. P. Fuller & Co., San Francisco.
"Satinette," Standard Varnish Works, 113 Front St., San Francisco.

WINDOWS—REVERSIBLE, CASEMENT, ETC.
Atkinson Safety Window at Building Material Exhibit, 77 O'Farrell street, San Francisco.
Hauser Reversible Window Co., 157 Minna St., San Francisco.

WIRE FABRIC
U. S. Steel Products Co., Rialto Bldg., San Francisco.

WOOD MANTELS
Fink & Schindler, 218 13th St., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.

Now is the Time to lay out your Country
Place with the best the market affords in

TREES ∴ SEEDS ∴ BULBS

CALIFORNIA SEED COMPANY

AL. J. NEVRAUMONT, Manager
Phone Douglas 5895

151 Market Street, San Francisco

Specify Fan Shell Beach Sand and Del Monte White Sand

for a Perfect Stucco Finish.

This shows the possibilities of Concrete Construction with Del Monte White Sand as one of the ingredients for a perfect cement finish.

Pacific Improvement Company
CROCKER BLDG.
San Francisco
Phone Sutter 6130

This House Designed by Architects Heiman-Schwartz is Equipped with PITCHER HANGERS

A Smooth Running Noiseless door hanger is a delight to the discriminating housewife.

A Pitcher

Hanger is an asset to Every Home, Apartment House and Hotel. Manufactured by

NATIONAL MILL & LUMBER COMPANY
326 Market Street
San Francisco

Telephone Kearny 3620

MOTT PLUMBING FIXTURES

Architects and their clients are invited to visit our Showrooms, 135 Kearny St., San Francisco; D. H. GULICK, Sales Agent. Los Angeles Office, 1001 Central Building; J. R. MAYHEW, Sales Agent. Portland, Ore., Office, Sherlock Bldg.; F. J. KANE, Sales Agent. Seattle, Wash., Office, Securities Bldg.; P. C. WAACK, Sales Agent.

THE J. L. MOTT IRON WORKS
Established 1828

CALIFORNIA STEAM AND PLUMBING SUPPLY CO.

PIPE, VALVES AND FITTINGS
FOR
STEAM, GAS, WATER AND OIL

COMPLETE STOCK OF
The Kelly & Jones Company Products
WRITE FOR CATALOGUE

OFFICE AND WAREHOUSE:
671-679 FIFTH STREET
Corner Bluxome
SAN FRANCISCO, CALIFORNIA

Telephone Sutter 737

For Modern RESIDENCES *and* APARTMENTS

PROMETHEUS

The Electric Food and Plate Warmer

Tenants of high-class apartments regard Prometheus as a household necessity—as much so in keeping meals warm as the refrigerator in keeping food cold.
Owners are installing Prometheus as an additional means of securing new and holding old tenants.
Prometheus keeps the meal steaming hot without injuring finest china. Wireless heating units of practically unlimited life, placed independent of shelves, are used exclusively.

THE PROMETHEUS ELECTRIC CO., Manufacturers
M. E. HAMMOND, 217 Humboldt Bank Building, San Francisco

SPECIFY GLAUBER FAUCETS

not only because they are GUARANTEED FIVE YEARS, but because of the QUALITY which enables us to guarantee them.

The Jury of Awards at the P. P. I. E. gave us **Seven Medals**, not because we indemnify our users against trouble with our goods, but because **Glauber Quality Faucets** don't cause trouble.

Three hundred of the best buildings on the Pacific Coast are equipped with **Glauber Cocks.**

Send for illustrated specification book.

Main Office and Factory
CLEVELAND, O.

Glauber Brass Mfg. Co.
567 Mission Street, San Francisco, Cal.

Eastern Branch
130 W. 32nd St.
NEW YORK

CALIFORNIA VITRIFIED BRICK

stands alone in its class among our Home Industries and is the best Paving Block made anywhere.

It is used on the streets of SAN FRANCISCO, OAKLAND, SAN JOSE, BERKELEY, SAUSALITO, LIVERMORE, SARATOGA, CALISTOGA and other California Cities.

Its use Insures Satisfactory and Permanent Pavements

INVESTIGATE NOW SAMPLES FURNISHED

California Brick Company

NILES, CALIFORNIA

Representatives at San Francisco and Oakland Exchanges

LIVERMORE PRESSED, MATT GLAZED AND ENAMELED BRICK

in a variety of colors including "Mottles," "Ruff," White, Ivory White, Cream, Grey, Green, Brown, Blue, etc., are designed to meet the requirements of Architects desiring permanent and unique effects.

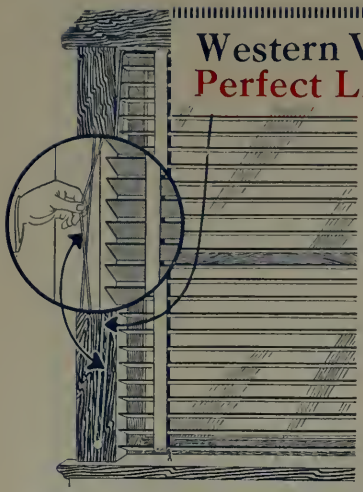
Full size sample sent on request.

LARGE PRODUCTION—ATTRACTIVE PRICES—PROMPT DELIVERIES

Livermore Fire Brick Works

LIVERMORE, CALIFORNIA

Representatives at San Francisco and Oakland Exchanges



Western Venetian Blinds *assure* Perfect Light and Ventilation

THE SLATS can be adjusted to Any Angle, supplying Light of the Exact Intensity Required. Easy to operate and will last as long as the building.

For Office Buildings, Municipal Buildings, Schools, Churches and Residences.

WESTERN BLIND & SCREEN CO.

2700 Long Beach Avenue

Los Angeles, - California

C. F. WEBER & CO., Agents

San Francisco Los Angeles Reno, Nev. Phœnix, Ariz.

Every Architect

and engineer who is interested in school construction will be interested in our new folder—"Buttonlath in Schools."

It proves conclusively the wonderful superiority of Buttonlath for use in public buildings; contains halftones of 17 new schools. Will be sent you free on request.

SOUND-PROOF WALLS

are a necessity in schools, where echoing and transmission of noises might easily disrupt the proper conduct of classes. Buttonlath has wonderful sound-deadening qualities; is remarkably fire-resistant; is allowed wherever metal lath is allowed.

MANUFACTURED BY

BUTTONLATH MANUFACTURING CO.

Boyle and Vernon Avenues
LOS ANGELES, CAL.

77 O'Farrell Street
SAN FRANCISCO, CAL.

FOR THE ARCHITECT

Who specifies a "PITTSBURG" Automatic Gas Water Heater — he is confident that his judgment will be commended.

FOR THE CUSTOMER

Who purchases a "PITTSBURG" Automatic Gas Water Heater — he is assured beyond a doubt of many years of satisfactory Hot Water Service.

PITTSBURG WATER HEATER COMPANY of California
478 Sutter St., San Francisco 402 15th St., Oakland

A Big Thing

New Model No. 65 "Pittsburg-Bungalow" Automatic Water Heater, Capacity three gallons per minute.

"FIRE—A CRIME"

We are equipped with two Pacific Coast Factories to manufacture
METAL DOORS—Tin, Kalamein, Composite, Hollow Steel and Bronze,—Swinging, Sliding, Folding, Elevator, Van Kannel Revolving Doors, and Wilson's Steel Rolling Doors.
METAL WINDOWS—Underwriters, Hollow Metal of all kinds, Kalamein, Bronze and Steel Sash.
☞ See the SIMPLEX METAL WINDOW.

United States Metal Products Co.

OF THE PACIFIC COAST
55 Tenth St., San Francisco 750 Keller St., Los Angeles
Agents and Branches in all Coast Cities.

DENISON INTERLOCKING TILE

and all kinds of

CLAY PRODUCTS

Phone MAIN 2028

CANNON-PHILLIPS COMPANY

Incorporated
Successors to DENISON BLOCK COMPANY
Plant North Sacramento 920 FORUM BUILDING SACRAMENTO, CAL.

QUALITY PAINT PRODUCTS
Brininstool

San-a-Cote (GLOSS)
(CAN BE SCRUBBED)

AN INTERIOR WALL FINISH
For bath rooms, kitchens, hospitals, schools, office and public buildings. Ask dealers, owners, architects and contractors about this durable, sanitary, washable, economical wall covering.

Brininstool makes a paint for every purpose, and every can purposely good

THE BRININSTOOL CO., LOS ANGELES

COLOR GRINDERS AND PAINT MANUFACTURERS

Distributors—The Brininstool Co., care of Haslett Warehouse Co., 310 California St., San Francisco; Schutz Paint Co., Fresno, Cal.; Schneider, Chappell & Jones, Sacramento, Cal.; Salt Lake Glass & Paint Co., Salt Lake City, Utah; Griffin Paint Co., Ogden, Utah; Ernest Miller Wall Paper Co., 172 First St., Portland, Ore.; Hickox-Crampton Paint Co., Tacoma, Wash.; Campbell Hardware Co., First and Madison Sts., Seattle, Wash.; Imperial Valley Hardware Co., El Centro, Calexico, Imperial, Brawley, Seeley; Spokane Hardware Co., Spokane, Wash.; Ellis Paint Co., Butte Mont.; Simons Paint and Paper Co., Missoula, Cal.

Satisfaction

given a tenant or buyer means good will and good business in the future. Wherever our Oscillating Portal Wall Beds have been installed you will find they are giving absolute satisfaction to the tenants. The added use of the rooms and the saving in housework they offer, have won for them the favor of the housewives. They are recognized as a proven utility and as a point in favor of the house where they are installed.

MARSHALL & STEARNS CO.

WALL BEDS

1152 PHELAN BUILDING — SAN FRANCISCO
1774 BROADWAY — OAKLAND

GEO. H. DYER, President — R. W. DYER, Vice-Pres. — W. J. DYER, Sec'y

DYER BROTHERS

Golden West Iron Works, Inc.

Structural Iron and Steel Contractors

ORNAMENTAL IRON WORK

Office and works:
17th and KANSAS STREETS

SAN FRANCISCO, CAL.
Phone Market 134

Cast Iron Entrance and Bronze Doors.
Lincoln High School, Portland, Oregon

EXECUTED BY

SARTORIUS COMPANY, Inc.
ORNAMENTAL IRON AND BRONZE
15th and Utah Sts., San Francisco

L. P. Hobart, Architect
Clinton Construction Co., General Contractors

The Pacific Coast Shredded Wheat Company
OAKLAND, CALIFORNIA

Every modern factory is an advertisement for Fenestra Solid Steel Windows

Ask for our Stock Sash Folder

Detroit Steel Products Co.
DEPARTMENT A20, DETROIT, MICH.

Fenestra
SOLID STEEL WINDOWS

Stationary Outfit

To ARCHITECTS and ENGINEERS

The Public is tired of buying Gasoline by hidden measurement—All up-to-date equipments demand the VISIBLE Method of Supply.

DELANOY VISIBLE SYSTEM

Any station equipped with the visible apparatus will sell from 25 to 50 per cent more gasoline than by the ordinary method. Send for Circulars.

RIX COMPRESSED AIR & DRILL CO.
Sole Manufacturers
San Francisco Los Angeles

"THE BOUDOIR" (Reg. Trade Mark)
Pat. Dec. 1913, Jan. 1915

Examine any bathroom, or any plan of a bathroom, with three separate fixtures set in any of the customary ways.

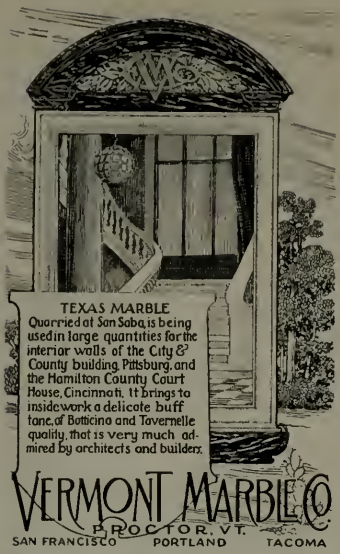
Cut out the separate lavatory, all its fittings, supply and waste pipes, trap, vent and connections. Sum up the cost of these; then

Substitute "THE BOUDOIR" Bath Fixture, with its large 20x24-inch pedestal lavatory, accessibly placed, taking no space usable for any other purpose.

Notice the improved appearance, additional room, the gained conveniences of a sitting shower, shampoo, washing in fresh running water, support in getting in and out of the bath tub, fewer fittings to polish and keep in order.

Prompt deliveries anywhere from our nearest Factory.

IMPROVED SANITARY FIXTURE COMPANY, 632 Metropolitan Bldg., Los Angeles, California, - U. S. A.


TEXAS MARBLE
Quarried at San Saba, is being used in large quantities for the interior walls of the City & County building, Pittsburg, and the Hamilton County Court House, Cincinnati. It brings to inside work a delicate buff tone, of Botticino and Tavernelle quality, that is very much admired by architects and builders.
VERMONT MARBLE CO.
PROCTOR, VT.
SAN FRANCISCO PORTLAND TACOMA

For That Empty Fireplace

The Humphrey Radiantfire

All the charm of an open fire
No odor — No ashes
A Gas Heater that heats.

GENERAL GAS LIGHT CO.
C. B. BABCOCK, Mgr.
768 Mission St. San Francisco

A BEAUTIFUL HOME—
IMPOSING ENTRANCE POSTS, Fence and Garden Ornaments, made of Cement, add an Indisputable Touch of Beauty and Feeling of Comfort to the Real Country House. The Fence, Posts, and Fruit Baskets shown in this picture were made by

G. Rognier & Co.

Garden Furniture, Flower Pots, Vases Sun Dials, etc.

Designs Submitted *233 Railroad Ave., SAN MATEO, CAL.*

HOTEL WHITCOMB
AT THE
CIVIC CENTER
OF
SAN FRANCISCO

¶ Free Garage for Guests.
¶ Dinner in the Arabesque Room, one dollar.
¶ Dancing in the Sun Lounge every Evening except Sunday.
¶ Room with bath, one-fifty and up.
¶ American and European.

J. H. VAN HORNE, Manager

Beautiful Oak Floors

are in use everywhere and are a source of unlimited satisfaction and pride.

¾-inch thickness **OAK FLOORING** offers a very **beautiful** and **durable** floor at a very **low cost.** It is the ideal flooring for laying over old pine floors in old buildings, as well as in new buildings over cheap sub-floors. When laid it has all the appearance of 1⅜-inch stock. Winter months are the best time for laying the ¾-inch over old floors, as it tends to create more work for the carpenters.

OAK FLOORING is **beautiful, distinctive** and **substantial** and rightfully deserves the name

America's Best Flooring

AMERICAN OAK FLOORING laid forty years ago in public buildings is still in good condition today after very hard service.

When you specify **OAK FLOORING** for any building you can rest assured that you have done a distinct service that will always reflect to your own credit.

Specify **AMERICAN OAK FLOORING** and satisfy your clients.

See our page 379—1917 Sweet's Catalogue. **Write for Folders.**

Oak Flooring Service Bureau

1603 UNION TRUST BLDG., CINCINNATI, OHIO

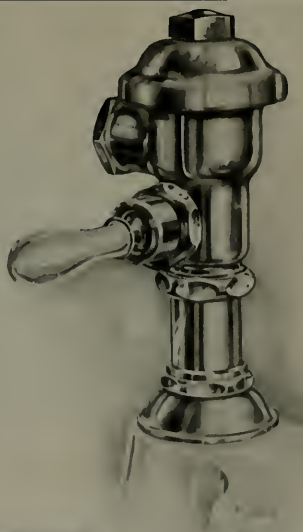
SLOAN VALVE COMPANY'S ROYAL FLUSH VALVES

Combine correct mechanical design and highest efficiency with ease of operation, extreme simplicity and remarkable durability.

Are furnished in a variety of styles, adaptable to a wide range of method of application and working conditions.

Moderate in cost to install—maintenance expense negligible. The ideal equipment for industrial, office, hotel and apartment buildings; schools, jails, comfort stations, etc.

You eliminate risk when you specify the Royal Flush Valve—its reputation is country-wide.



SLOAN VALVE COMPANY

Chicago, Ill.

or 624 Wells Fargo Building, San Francisco

ANYTHING in the BUILDING LINE from Basement to Roof—You'll find it at the...

BUILDING MATERIAL EXHIBIT

77 O'Farrell Street, San Francisco — No trouble getting you information Mr. Architect, Mr. Owner. Call us up if you haven't time to drop in. We are at your service. No fees. Phone Sutter 5333.

"LOOK BEFORE YOU BUILD"

HOTEL ST. FRANCIS

SAN FRANCISCO

Most Beautifully Decorated Public Rooms in the World
European Plan from $2.00

Management :: :: :: JAMES WOODS

STEEL BARS FOR CONCRETE REINFORCEMENT

TWISTED SQUARES, PLAIN SQUARES AND ROUNDS
We Will Make Lump Sum Bids on Reinforcement Fabricated and Installed.

PIG IRON, COKE AND FERRO ALLOYS

WOODS, HUDDART & GUNN

444 MARKET STREET Tel. Sutter 2720 SAN FRANCISCO, CAL.

STEEL OPEN HEARTH BARS FOR CONCRETE REINFORCEMENT

Square Corrugated and Cold Twisted, Plain Rounds and Squares
-----MERCHANT STEEL-----
Flats, Angles, Channels, Rounds, Squares, Rivet & Bolt Steel, Structural Shapes

PACIFIC COAST STEEL COMPANY

PHONE SUTTER 1564

General Office, Rialto Bldg., San Francisco
Sales Office, " " "
Sales Office, Union Oil Building, Los Angeles
Sales Office, Seattle, Wash.

ROLLING MILLS:
South San Francisco
Seattle, Wash. Portland, Ore.

"Havemeyer" Deformed STEEL BARS

FOR REINFORCED CONCRETE CONSTRUCTION

Southern California Iron & Steel Co.

FOURTH AND MATEO STREETS
LOS ANGELES, CAL.

W. B. KYLE, New Call Building,
San Francisco Representative.

THE RAY OIL BURNING SYSTEM—1917 MODEL

Improvements: Enclosed motors, dust, oil and water proof; oil-cooled motor runs 75 per cent cooler; oil heated electrically. Only one place to lubricate for entire machine, and many more exclusive features. Send for catalogue.

W. S. RAY MFG. CO.

Salesroom, 218-220 Market St., SAN FRANCISCO
Phone Kearny 199

Works, Bosworth, Milton & Rousseau, S. P. R. R., San Francisco. Phone Mission 8022

THE NEW CASINO THEATRE, SAN FRANCISCO
BEN G. McDOUGALL, Architect

San Francisco's Newest Home of Vaudeville, Fireproof and Right-up-to-the-minute in Construction Features, has been Waterproofed and Coated with

MAUERENE LIKWID SEMENT

THIS preparation does away with the necessity of plastering the Exterior of a Concrete Building. thus very materially reducing the Cost. LIKWID SEMENT gives you a non-checking, non-scaling, non-staining, waterproof job. Any color — any texture. ¶ Other notable buildings treated as above: First National Bank Bldg., San Francisco; Santa Fe Office Bldg., San Francisco; Western Pacific Railroad Company's Depot at Stockton and U. S. Government buildings at Fort McDowell.

THE IMPERIAL COMPANY

Phone Sutter 1341 717-719 Monadnock Building, San Francisco

ADMINISTRATION BUILDING AT SEAL BEACH FOR BAYSIDE LAND CO., ORANGE COUNTY, CALIFORNIA EDWIN J. SYMMES, Architect

Faced with **Red Ruffled Brick**

and Roofed with

RED MISSION TILE

Manufactured by

Los Angeles Pressed Brick Company

FROST BLDG., LOS ANGELES, CALIFORNIA

UNITED MATERIALS COMPANY

CROSSLEY BUILDING, SAN FRANCISCO

Distributers for Northern California

The GOLD MEDAL MAIL CHUTE

INSTALLED IN THE NEW SAN FRANCISCO CITY HALL AND THE WHITE MARBLE MERRITT BUILDING, LOS ANGELES

Given highest award at Panama-Pacific International Exposition, 1915.

Waterhouse-Wilcox Co.
California Representatives
8 Monadnock Bldg. (Arcade)
SAN FRANCISCO
331 E. 4th Street.
LOS ANGELES
F. T. CROWE & CO.
Seattle
Agents for Washington
American Mailing Device Corporation

The Cutler Mail Chute

Mail Box—L. C. Smith Building Seattle, Wash.,
Gaggin & Gaggin, Architects, Syracuse, N. Y.

Pacific Coast Representatives:

San Francisco, Cal., THOMAS DAY COMPANY.
Portland, Ore. C. W. BOOST.
Seattle and Tacoma, Wash., D. E. FRYER & CO.
Spokane, Wash. E. C. TOUSLEY.

Cutler Mail Chute Co.,
ROCHESTER, N. Y.
Cutler Building.

BIGLEY'S

Curtains
Decorated Lamps
and Pottery
Fine Upholstered
and Period
Furniture

498 GEARY STREET
San Francisco, Cal.
Telephone: Franklin 5919

THE·L·SCHREIBER & SONS Co

ORNAMENTAL IRON & BRONZE
STRVCTVRAL STEEL
CINCINNATI

SAN FRANCISCO
WESTERN BVILDERS SVPPLY CO
155 NEW MONTGOMERY ST.
LOS ANGELES
SWEETSER & BALDWIN SAFE CO
200 EAST 9TH ST

CRANE FITTINGS

MALLEABLE CAST IRON

ARE THE STANDARD

because they do the work that they are made to do with a liberal factor of safety. Accurately made, chamfered threads, and properly proportioned they are the choice of all good architects.

We carry in stock at all times the largest line of sizes and shapes so that we may meet promptly whatever calls are made for these goods. Our Catalogue No. 50 (which will be sent on request) further illustrates and describes the extensive line of CRANE FITTINGS.

CRANE CO.

PLUMBING SUPPLIES

Steam and Hot Water Heating

2ND & BRANNAN STREETS SAN FRANCISCO

H. E. BOTHIN, PRESIDENT
W. H. FRENCH, VICE-PRES. AND GEN. MANAGER
R. B. GIRDWOOD, SECRETARY

JUDSON MANUFACTURING CO.

MANUFACTURERS OF

OPEN HEARTH STEEL

INGOTS, BARS, PLATES AND SMALL SHAPES

STRUCTURAL AND BRIDGE WORK
FOUNDRY, MACHINE AND PATTERN WORK
SHAFTING, BOLTS, SPIKES ETC

MAIN OFFICE AND SALESROOM
819-823 FOLSOM STREET
TELEPHONE BUTTER 6626

OPEN HEARTH STEEL BARS

STRUCTURAL STEEL

Machine Work—Bolts—Castings
Pattern and Blacksmith Work

FERALUN

SAFETY TREADS

UNDERWRITERS' LABORATORIES, INC.
INSPECTED
ANTI-SLIP TREAD
FERALUN AMERICAN ABRASIVE METALS CO NEW YORK

The ONLY efficient Safety Tread to bear the Underwriters' Label.

PACIFIC BUILDING MATERIALS CO.

523 Market St. TELEPHONE KEARNY 3323 S. F.

FORUM BUILDING, SACRAMENTO, CAL.
R. A. Herold, Architect

The above is a Progress Picture of the Four Story addition to Sacramento's Largest Office Building, Now Completed.

STRUCTURAL STEEL FABRICATED AND ERECTED BY

The Palm Iron and Bridge Works

(Incorporated)

15th and R. Sts., Sacramento, Cal.

CALIFORNIA ARTISTIC METAL & WIRE CO.
J. T. McCORMICK, PRESIDENT
ORNAMENTAL IRON AND BRONZE
349-365 SEVENTH ST. SAN FRANCISCO

MORTENSON CONSTRUCTION CO.
CONTRACTORS FOR STRUCTURAL STEEL AND IRON
H. MORTENSON, Pres. CHAS. G. MORTENSON, Vice-Pres. and Mgr.
OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS
PHONE: MISSION 5033 SAN FRANCISCO, CAL

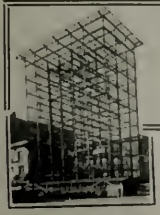
WEST COAST WIRE AND IRON WORKS
MANUFACTURERS OF
ARTISTIC BRONZE, IRON AND WIRE WORK
OF EVERY DESCRIPTION AND FINISH
861-863 HOWARD STREET SAN FRANCISCO, CAL.

FAIR MANUFACTURING COMPANY
J. FEY KERT, Proprietor
ORNAMENTAL AND MISCELLANEOUS IRON WORK
617 BRYANT STREET, SAN FRANCISCO Douglas 5122

THE GOLDEN GATE IRON WORKS
STRUCTURAL STEEL
1541-1549 HOWARD STREET, BETWEEN 11th AND 12th STREETS
Tel. Market 5445 San Francisco

Telephones Mission 139—Mission 59 A. A. Devoto, President
CENTRAL IRON WORKS, Inc.
STRUCTURAL STEEL
Office and Works: 621-651 Florida Street
Bet. Harrison and Bryant, 18th and 19th SAN FRANCISCO, CAL.

ZOURI SAFETY STORE FRONT BARS
C. JORGENSEN & COMPANY
Phone Kearny 2386 Room 20 618 Mission St., San Francisco



SCHRADER IRON WORKS, Inc.
STRUCTURAL STEEL CONTRACTORS
Fire Escapes, Waterproof Trap Doors, Ornamental Iron Work
1247-1249 HARRISON STREET SAN FRANCISCO, CAL.
Bet. 8th and 9th Telephone Market 337

P. Noble, Pres.
E. B. Noble, Vice-Pres.
A. E. Wilkins, Sec'y

Beam, Angle, Channels, and Universal Mill Plates for immediate shipment from stock

Pacific Rolling Mill Co.

SUPPLIERS OF

FABRICATED STRUCTURAL STEEL, Forgings, Bolts, Rivets, Frogs, Switches, Cast Iron Castings

General Office and Works
17th and MISSISSIPPI STS., SAN FRANCISCO
Telephone Market 215

W. B. MORRIS, President H. M. WRIGHT, Vice-President L. J. GATES, Secretary

WESTERN IRON WORKS

STRUCTURAL IRON and STEEL CONTRACTORS

Gas Holders, Vault Linings, Jails, Fire Escapes, Beams, Channels, Angles and Steel Wheelbarrows Carried in Stock

Phones: Kearny 575
J 1259

141-147 BEALE STREET
132-148 MAIN STREET
SAN FRANCISCO, CAL.

TELEPHONE. MISSION 1763

C. J. HILLARD CO., Inc.

MANUFACTURERS OF

Bank and Office Railings. Elevator Enclosures and Cars.
Cast Iron Stairs and Store Fronts. Wire Work. Fire Escapes.

Nineteenth and Minnesota Sts.
Next to California Canneries

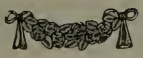
San Francisco, Cal.

Structural Steel
Ornamental Iron
Ornamental Bronze
Prison Work
Vault Work
Metal Furniture
Filing Devices
Library Shelving
Stock Room Shelving
Steel Lockers
Electroliers

RALSTON IRON WORKS

INCORPORATED
TWENTIETH AND INDIANA STREETS
SAN FRANCISCO, CALIFORNIA
PHONE MISSION 5230

Antiquities, Artistic Ornaments for the Interior



A little expenditure adds to your Home Decorations the Grace of Genuineness and Rare Artistry.

A. FALVY

578-580 SUTTER STREET

Tel. Sutter 6939 SAN FRANCISCO

Architects designing hotels, apartment houses, theatres and office buildings, should keep in mind the fact that THREE BARRELS OF FUEL OIL burned by the

Fess System

will equal the heat produced by a TON OF COAL — *Economy for the Owner.*

And that the FESS SYSTEM is the Only Fire-Proof Rotary Burner manufactured — *More Economy for the Owner — Less Insurance to pay.*

Fess System Rotary Crude Oil Burners

FOR HEATING, POWER, COOKING

Office and Factory — 218 Natoma St., San Francisco

Branches — 1310 So. Hill St., Los Angeles; 428 Alder St., Portland, Ore.; 132 B St., San Diego.

Hipolito

EVEN TENSION

Window Screens Screen Doors

ROLLER SCREENS

For Casement Windows

METAL FRAME SCREENS

SEE DISPLAY AT

Building Material Exhibit

77 O'Farrell St. San Francisco

Simpson & Stewart

FACTORY DISTRIBUTORS

565 16th St., Oakland, Cal.

TELEPHONE LAKESIDE 415

MAY BE OPENED AT THE TOP FOR LIGHT
BETTER THAN WINDOW SHADES
BURLINGTON VENETIAN BLINDS
can be adjusted to *let in* light and air, yet *keep out* the sun and the gaze of outsiders.
For the home, school, bank and office building.
Look for the name Burlington and be assured of the best.
AND CLOSED AT THE BOTTOM FOR PRIVACY

Burlington Venetian Blind Co.

BURLINGTON VT. 365 MARKET ST., SAN FRANCISCO

Illinois Automatic Vacuum and Vapor Systems of Heating

Improved with graduated control. You can have much heat or little as conditions demand. Our Thermo Trap prevents any waste of heat and consequently saves fuel. Used in the biggest buildings and factories all over the United States and Canada.

We also manufacture a full line of Hughson, John Davis, Eclipse Pressure Reducing Valves and Back Pressure Valves, Oil Separators, etc.

"Twenty-five years of quality."

We carry a full line in San Francisco.

ILLINOIS ENGINEERING COMPANY

JAS. I. KRUEGER, *Representative*

559-561 Pacific Building, San Francisco

Telephone: Kearny 3047

Frederick W. Snook Company

PLUMBING

Branch Office
104 San Mateo Drive
Phone Burlingame 998

596 Clay St., San Francisco, Cal.
Phone Kearny 1374

JOHN A. HOOPER, Pres. FRANK P. HOOPER, Vice-Pres. A. W. HOOPER, Sec'y

Hooper Lumber Company

Wholesale and Retail Dealers in

OREGON PINE AND REDWOOD

17th and Illinois Sts., San Francisco

Car shipments to all Central California Points
Schooner shipments to Bay and River landings

Contractors' House Bills solicited
Phone Market 5313

OIL BURNERS
VACUUM PLANTS
ICE MACHINES

The Three Essentials for the Up-to-date HOTEL and APARTMENT HOUSE.

With a JARVIS Guarantee Your Troubles Are Over.

Home Manufacture—Everything but the motors

T. P. JARVIS MANUFACTURING COMPANY

Phone Market 3397 275 Connecticut Street, SAN FRANCISCO

GRAVEL

NILES SAND GRAVEL & ROCK CO.

GRAVEL BEDS AND PLANT, NILES, CALIFORNIA
MAIN OFFICE
MUTUAL BANK BUILDING
704 MARKET ST.
SAN FRANCISCO

TELEPHONE DOUGLAS 182

Crushed and screened concrete Gravel and Rock. Sharp, clean Concrete Sand, or Topping. All from fresh water, thoroughly washed, and in any size or mixture, with or without sand, as desired.

Free from Salt.

A. F. EDWARDS, President
J. M. FABBRIS, Vice-President
J. A. MACKENZIE, Secretary
CHAS. F. EISELE, J. RUBIOLO, Asst. Managers

AMERICAN
MARBLE & MOSAIC CO.

25-29 Columbia Square, San Francisco
Telephone Market 5070

Factory on Canal, South San Francisco Telephone South San Francisco 161

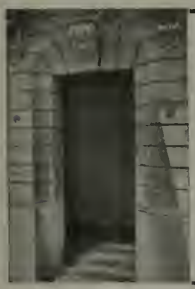
THE BITURINE COMPANY

Specializing in Protective
Coatings for Iron and Steel

STRUCTURAL STEEL PAINT
INTERIOR TANK ENAMEL

Telephone
Kearny 4478

24 CALIFORNIA STREET
SAN FRANCISCO



THE KINNEAR MFG. CO.
COLUMBUS, OHIO

STEEL ROLLING FIREPROOF
DOORS AND SHUTTERS

Agents
Seattle - Portland - Los Angeles - Salt Lake City

San Francisco Office, 523 Market St. Tel. Kearny 3323

THE ARCHITECT & ENGINEER

VOL. LI. OF CALIFORNIA No. 2

CONTENTS for NOVEMBER, 1917

	Page
Frontispiece—Entrance Porch and Doorway, the "Octagon," Washington, D. C.	38
A Return to the Colonial Albert Farr, Architect	39
A Chinese Apartment House	59
The Southern Pacific General Office Building Frederick Jennings	61
California Cotton Mills' New Building A. C. Griewank, C. E.	71
Competitions W. Garden Mitchell, Architect	75
Washington State Capitol Building Controversy	77
An Awakening in Garage Architecture	79
New Home of the Berkeley Tennis Club	81
Oakland-Alameda Bascule Bridge	83
Portfolio of Photographs of the Frieze in the Main Entrance Lobby of the California Theatre	85
A Bungalow Adaptation of the Swiss Chalet or English Style of House W. R. B. Willcox, Architect	93
Interior Decoration—the Dining-Room	99
Editorial	104

Index to Advertisements, page 8

Published Monthly at 626-627 Foxcroft Building, San Francisco in the interest of

ARCHITECTS, STRUCTURAL ENGINEERS, CONTRACTORS AND THE ALLIED TRADES OF THE PACIFIC COAST

Yearly Subscription $1.50
Single Copy 25 cents

Entered at San Francisco Post Office as Second Class Matter

Copyright 1917 by A. I. Whitney
All Rights Reserved

ENTRANCE PORCH AND DOORWAY, THE "OCTAGON," WASHINGTON, D. C.
(House erected in 1800 by Colonel John Taylor, a friend of President George Washington)

Frontispiece
The Architect and Engineer
of California
for November, 1917

THE
ARCHITECT
AND
ENGINEER
OF CALIFORNIA

NOVEMBER, 1917 Vol. LI. Number 2.

A Return to the Colonial

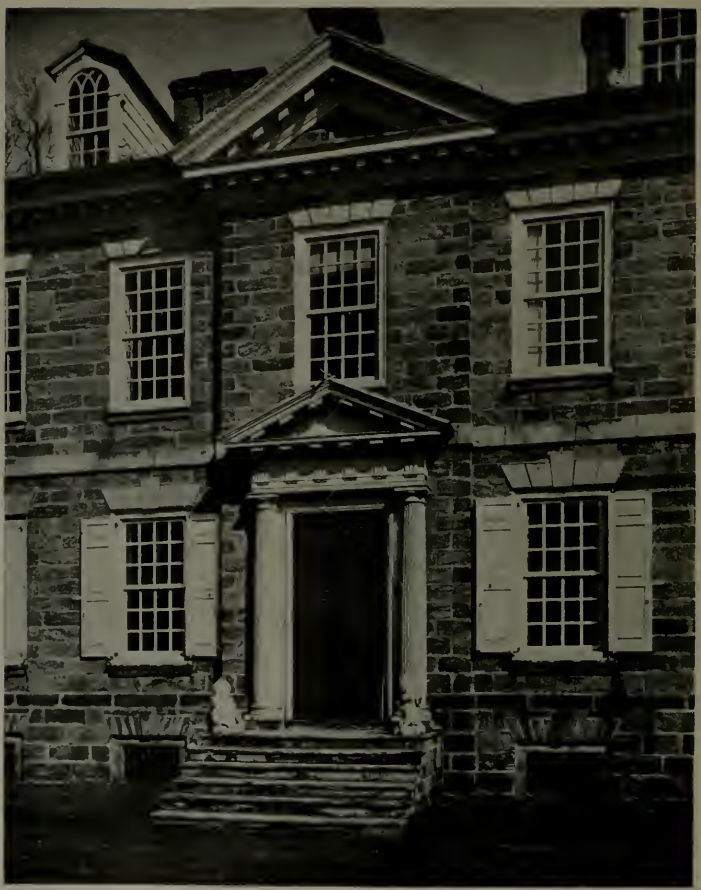
By ALBERT FARR, Architect.

IN these days of jazz bands, bungalows, chewing gum and other nervous disorders, it is a relief to discover evidence of a return to the simpler ways of the forefathers of our country. There is no more refreshing indication of this, than is shown in the renewed interest in Colonial architecture, with its well ordered fenestration, direct plans and carefully studied detail, modern examples of which are beginning to show in the suburbs of many of our cities.

Arising as this style undoubtedly did from the classical studies of our ancestors, its culture plainly shows the opinions of their day. Housed within its simple dignity, we may imagine Thomas Jefferson, let us say, seated on a Sheraton chair, arrayed in Georgian splendor, clay pipe in mouth, and Plato's Republic in hand, dreaming of his country's future government patterned to an antique and lofty standard.

For books and living, which is mostly housing, go hand in hand—and politics and government follow—classic learning was the culture of the 18th and early 19th centuries, gentlemen of England and France, priding themselves not alone on their Greek and Latin, but upon their knowledge of art and architecture as well, and we Colonials followed dutifully in the paths of our betters.

Whatever this knowledge may have been, it was probably inexact, and citing from an earlier period, we read in Evelyn's Diary his description of the long since destroyed royal manor of Nonsuch, done "in the Italian manner," it is obvious that Nonsuch was not Italian at all, but excellent Jacobean. So of the period of which we consider, we probably had a similar intent to follow older exemplars and arrived at much the same goal as King Charles' Surveyor.



FRONT ENTRANCE TO CHEW HOUSE, GERMANTOWN, PA.

To sum up, our beloved "Colonial" is but an attempt at transplanting the English Renaissance of the Georges, tinctured from necessity to a greater or less degree by the Adam brothers with something somewhat French, somewhat of late Rome, and considerably of the Greek of Pompeii. The necessity spoken of was lack of material and of skilled labor, so that much of internal work, such as mantel-pieces, grates, and fruit swags was bodily brought from London.

The learning thus acquired and the material imported were poured into a newer mold, to which our Dutch forebears had something to add, with the aid of Vignola and Palladio, antiquarians themselves.

Necessity, the parent of all architecture, forbade the use of carefully cut stone at all and not much of any other kind.

So, as before, in centuries past, a "style" came into being with countless offspring, some bad, some indifferent, but many worthy of earnest consideration. We may place this period in the latter part of the eighteenth and earlier nineteenth century.

A late example of the interest shown in this style is the restoration of the interior of the New York City Hall. Among other monumental Colonial buildings is the State House of Boston, reproduced by Massachusetts at the P.-P. I. E., and Independence Hall of Philadelphia. The two latter buildings are too well known to require comment.

Our general interest, however, centers in the more practical application of the forms to domestic architecture, and in illustration the following photos and drawings are selected as being particularly good examples of Colonial expression:

ENTRANCE TO THE CHEW HOUSE, GERMANTOWN

Like many Pennsylvania houses, the walls of this building are of stone with wood cornices, columns, etc. This example is nearly pure Georgian and follows closely the then prevailing English residence, the only marked departure being found in the dormer windows.

GARDNER-WHITE-PINGREE HOUSE

Doorway from Salem, shows the attenuated order and delicate proportions of the more American practice.

MANSFIELD-BOLLES HOUSE DOORWAY

Another Salem house, with the same graceful lines, typical fan and side lights which in other examples are often in leaded lines with beautifully molded lead medallions or other dainty ornaments at the crossings of the leads. The photo shows a characteristic use of contrasts in color, as the dark door against the light jambs, which was also resorted to on the interiors, the moldings, mantels, etc., being usually light in color with dark mahogany furniture against the same.

Other exteriors show details from Palladio and "Vignola's orders."

Types of cornices, wainscot, mantels and door casings are shown on interior plates. As has been said before, all of the decoration, and much of the woodwork of the earlier examples were brought from England, as bills of lading of the period show. Several hob grates are illustrated probably made by a firm which still turns out the same patterns today.

In the plate of the Cook-Oliver house, one of the beautiful hand-made "scenic" French wall papers of the early 18th century appears.

GARDNER-WHITE-PINGREE DOORWAY, SALEM, MASS.
DESIGNED BY SAMUEL McINTIRE

DOORWAY OF MANSFIELD-BOLLES HOUSE, SALEM, MASS

JEREMIAH LEE HOUSE, MARBLEHEAD, MASS.
(Erected in 1768 and said to be the best paneled house in America.)

DETAIL OF WINDOW, "THE WOODLANDS," PHILADELPHIA
Erected 1772 by James Hamilton

HAND CARVED STAIRWAY, ALLEN HOUSE, SALEM, MASS.

A stairway of Salem shows the masonry-like arrangement of stepping generally effected, the variation of balusters used in more elaborate houses, and the balustrade finished in dark mahogany against the white of other wood. A sensible as well as attractive handling of the finishing of woodwork. A simpler stairway is shown in the gallery landing of the Pierce-Johonnot-Nichols house with a "period" paper which has recently been copied by an American manufacturer.

It is to be hoped that these plates, which are only a few of the documents in Colonial architecture easily procured, may lead to the wider use of a style of building which has so much to recommend it.

* * *

"The Spirit of the Colonial" is the title of an interesting article by Mr. Phil M. Riley in a recent number of Hoggson's Magazine. Mr. Riley says:

Every country has a dominant style in architecture possessed of distinguishing traits expressive of the character and life of the people. It is a living style representing the best thought of its builders, always definitely related to what has gone before, yet ever capable of higher refinement and broader adaptation to express the spirit and meet the needs of each successive generation; it is a style that develops, but never grows old.

In the United States we have the so-called Colonial style, the one distinctive type of American architecture that is known throughout the world. Sometimes referred to as merely a Yankee name for Georgian, an English revival of the classic in America, it is that and much besides. Including the several Renaissance expressions of the Dutch and French as well as the English peoples in America, it evolved among us, adapting itself to the lives and supplying the needs of our forefathers. Its early manifestations were almost too simple to deserve consideration, but about the end of the eighteenth century it became the very flower of our domestic architecture, the priceless heritage of our nation.

When our forebears in England were first moved to admiration by the Renaissance in Europe, Wren, Jones, Chambers, Adam and their associates turned to Italian architects, notably Palladio and Vignola, for inspiration, and unhesitatingly adopted those clever motives and details of another time and people. These were copied and utilized with relatively little creative ability or imagination and became characteristics of the so-called Georgian, a Renaissance expression differing from the Italian chiefly in the absence of that remarkable subtility of outline and proportion achieved by the master architects of the Latin race.

In America results were happier, very largely because of the translation from stone into wood, of which so many houses were built. The shipbuilding industry of New England also developed many highly skilled wood-carvers, whose art lent additional refinement. Through these two influences heavy Georgian motives gave way to the lighter, more graceful designs which we admire so much.

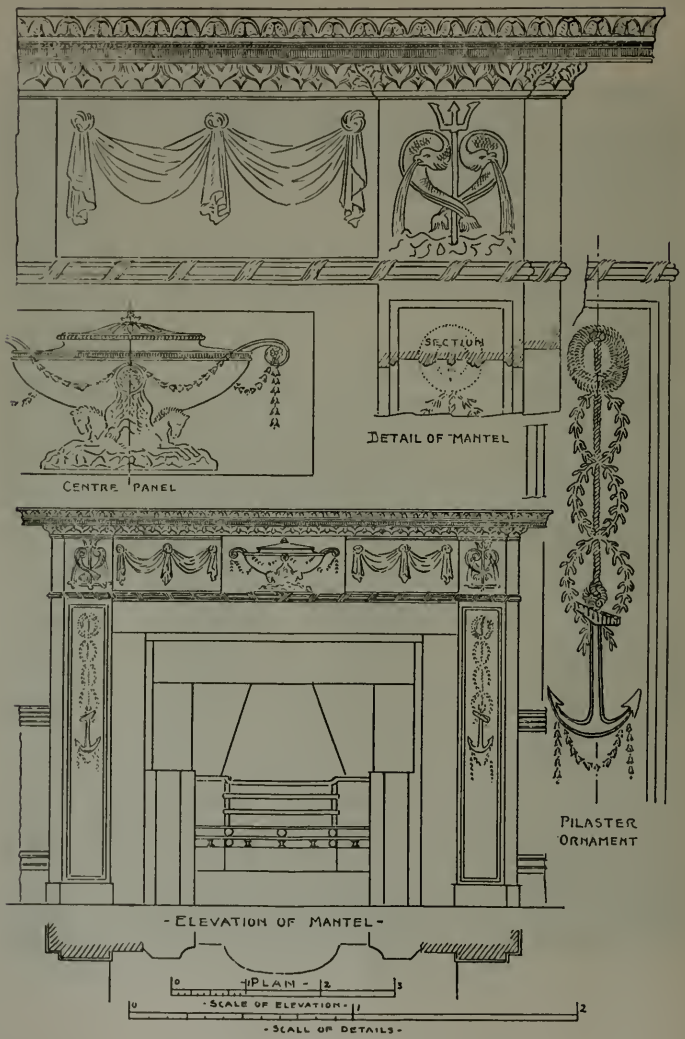
The inspiration was partly English, it is true, but Palladio and Vignola were studied as assiduously as in Great Britain, with the result that contemporaneous American designers succeeded in improving upon the somewhat colorless Georgian to the extent of placing upon their adaptations the indelible stamp of their strong character, high ideals and simple life-habits. Not subservient to the style, they dominated it, molding it to their modest needs and making exterior appearance frankly express interior arrangement and domestic uses; they gave to it a distinctive character which the English Georgian lacks.

Thanks to the lasting appeal of its real merit and to the horrors of that illogical period of architectural decadence now referred to as the Victorian era, the Colonial tradition persists today more firmly intrenched than ever in Ameri-

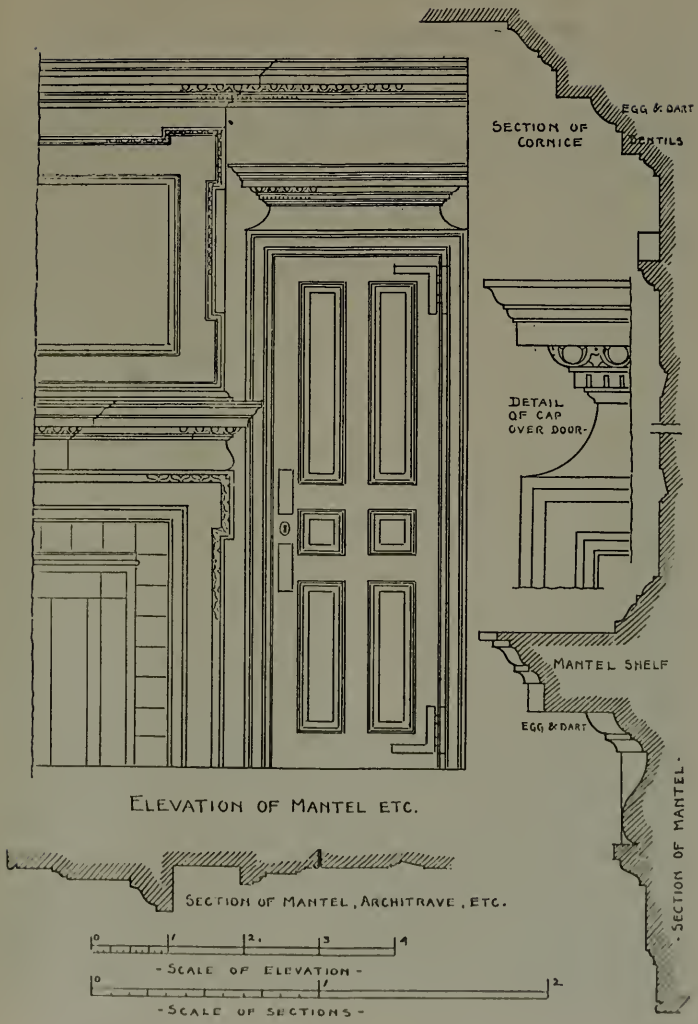
DETAIL OF CHINA CLOSET AND HALF SECTION OF MANTEL, PIERCE-JOHONNOT-NICHOLS HOUSE, SALEM
SAMUEL McINTIRE, ARCHITECT

HAND CARVED DOORWAY IN COOK-OLIVER HOUSE, SALEM, MASS.
SAMUEL McINTIRE, ARCHITECT

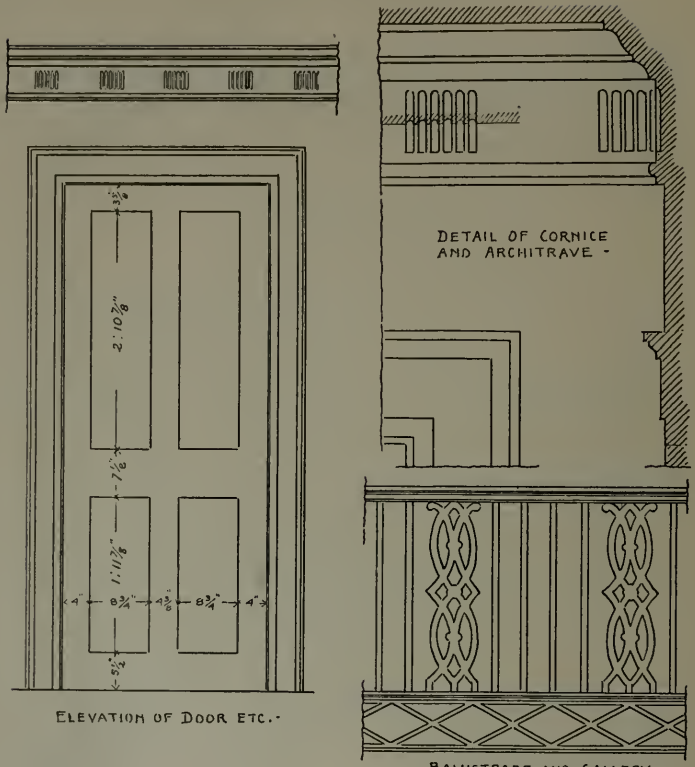
(French wall paper printed in Paris in 1820.)



DETAILS OF THE DINING ROOM MANTEL IN THE OCTAGON AT WASHINGTON - D - C -



DETAILS OF MANTEL AND FINISH IN WEST PARLOR OF THE NICHOLS HOUSE - FEDERAL ST., SALEM, MASS.



DETAILS OF DOOR AND BALUSTRADE IN THE PIERCE-JOHONNOT-NICHOLS HOUSE, SALEM, MASS.

can esteem. The stoppage of that attempted revival of mediæval styles and ill-advised transplantings from distant lands through the general suspension of building was one of the few happy results of the Civil War.

More new houses are now being built in the spirit of our eighteenth and early nineteenth century farmhouses and mansions than with any other guiding motives. Their basic principles and details are still in constant use, often employed in original ways to fulfill the new purposes of our ever-changing life, but always closely associated with the spirit of the original usage. By this broad application great diversity of design is permitted, yet a very desirable restraint is exercised through the influence of that which has gone before.

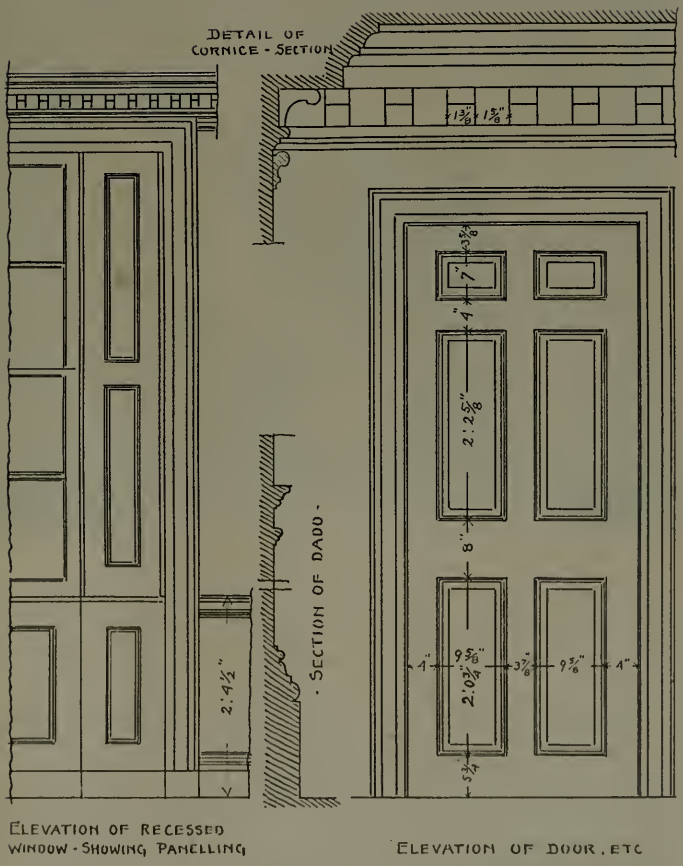
Colonial is a comprehensive term including much of a widely differing character. Surely we have ample evidence that it is broad enough for almost

DETAIL OF BALUSTRADE IN PIERCE-JOHONNOT NICHOLS HOUSE, SALEM, MASS.
SAMUEL McINTIRE, ARCHITECT

DETAIL OF INSIDE OF FRONT DOOR, PIERCE JOHONNOT-NICHOLS HOUSE, SALEM, MASS. SAMUEL McINTIRE, ARCHITECT

MANTEL IN COOK-OLIVER HOUSE—SALEM, MASS.
SAMUEL McINTIRE, ARCHITECT

HAND CARVED WOOD MANTEL IN PEABODY-SILSBEE HOUSE, SALEM, MASS.
SAMUEL McINTIRE, ARCHITECT



DETAILS OF DOOR, DADO, CORNICE AND PANELLING
IN HOSMER-WATERS HOUSE SALEM MASS

CAST CEMENT MANTEL IN THE "OCTAGON," WASHINGTON, D. C.

any purpose. This diversity is one of its principal charms. How different yet how similar are the New England farmhouse, the town houses of Salem, Boston, Philadelphia and Baltimore, the Dutch Colonial cottages of New York and New Jersey, the Pennsylvania farmhouse and the stately mansion of the South!

The motives and details are much the same and relatively few in number, yet how varied are the effects as the whole mass of the structure, the contour of its roof, the doorway and other details of its façade differ! They are the result of dissimilar adaptation according to the state of affluence, racial characteristics, taste, skill and local materials. Monotony through too great similarity of neighboring houses must surely be the fault of the architect rather than of his medium of expression. No such monotony exists even in old cities such as Salem, Massachusetts, where nearly every building worthy of notice is Colonial.

The ready adaptability of the Colonial style to the needs of the present day and such new uses and refinements of the modern home as piazzas, sleeping-porches and sun parlors, is due to the fact that its beauty lies chiefly in nice proportion and graceful ornamentation of its motives. These very qualities, however, are

Editor's Note.—Acknowledgment is made to J. A. & W. Bird & Co. of Boston, distributors of Ripolin Enamel Paint, for the use of many of the splendid Colonial plates used to illustrate this article.

responsible for most of the failures of adaptation. In styles incorporating a profusion of detail, salient points are often so confused as to result in an apparently successful adaptation; not so in Colonial. A well-known architect has truthfully said that in Colonial design there is no more latitude for "faking" than in the delineation of a circle; either it is perfect or it is not. It follows, then, that old houses which are selected as models for purposes of adaptation should be chosen with the utmost regard for their harmony of motives, nicety of proportion and refinement of detail. Inconsistencies result when proper distinctions have not been made, and in this connection the services of a skilled architect and experienced builder of wide knowledge and sympathetic interest are not only important, but really are invaluable.

* * *

A Chinese Apartment House

SOME interesting particulars regarding the apartment house as it exists in China were given out a short time ago by Mr. Thomas W. Clarke, a construction engineer, recently returned from the Orient. Referring to a photograph which he had, he stated that the apartment house shown was more than 400 years old and housed about 400 families.

"It is the chief building of a village in the southern end of the Fu-Ken Province, South China, about 300 miles from Hong Kong. Built in a perfect circle, it is five stories high and is massively constructed of stone and brick. Its design shows that it was built as much for protection as for dwelling purposes. There are no windows on the outside, and enemies would have to scale the walls before they could harm those within. There is only one entrance, a very strong gate, capable of standing siege for a long time unless attacked with modern weapons. Undoubtedly the house was built to withstand the pirates and roving bands of robbers that terrorized Fu-Ken Province in the old days.

"The outside wall is about 50 feet high and about 350 feet in diameter. The interior court is 400 feet across, paved with great stone blocks. Right in the center of the yard is the communal water supply, a large cistern which is fed by the water from the roof running through terra cotta drains.

"There are no modern conveniences, and the various tenants reach their dwellings by way of bamboo ladders.

"The apartments are 12 feet wide, and the floors are made of rough-hewn lumber laid over poles of Chinese fir.

"The roof is made of heavy terra cotta tiles laid so that the edges overlap, and it is weatherproof. Furthermore, the tiles afford perfect shelter from the sun, which is hot in South China, and the top floor apartments are as cool as those lower down. The whole structure is weatherproof.

"Every apartment has its own veranda. These run around the whole interior of the house and face on the courtyard, which often serves as a market place when merchants are allowed to come in from near-by villages. The courtyard is also the meeting place of all the residents of the apartment house, and there everything of interest to the community is discussed.

"The four hundred families include considerably more than 1000 persons, and they have a government of their own. It is not unlike the much advertised form of commission government adopted in some of the towns and cities in this country."

* * *

Don't be discouraged if you make an occasional mistake; if men didn't there wouldn't need to be any claw on a hammer.

OFFICE BUILDING FOR THE SOUTHERN PACIFIC COMPANY, SAN FRANCISCO
Bliss & Faville, Architects

REAR ELEVATION, SHOWING COURT AND WINGS, SOUTHERN PACIFIC OFFICE BUILDING, SAN FRANCISCO

The Southern Pacific General Office Building

By FREDERICK JENNINGS

THE Southern Pacific General Office Building, recently completed in San Francisco, is designed primarily to house the executive officers and clerical force of the Southern Pacific Company, and although there are no special features that are different from an ordinary office building, except in the division of space, there are some points which have been a trifle exaggerated to accommodate the needs of this particular body of workers.

The main corridor, running parallel with Market street, is made wider than in the average office structure in order to accommodate the great numbers of auditors and clerks who take their noon hour and leave the same time each day. The interior partitions are made in unit divisions, as the departments change in personnel and often in function, and it is necessary to be able to move a great many of the partitions without disturbing the building.

The detail of the building is Italian Renaissance, carried out with Roman brick and terra cotta trimmings. The color is new and especially successful, as it gives a warmth to the whole without running into the heaviness of the red brick. The relief of the facades by the corner pavilions and balconies is quite sufficient to keep the design from being monotonous and at the same time preserves a certain simplicity which is so essential to a successful building of this type.

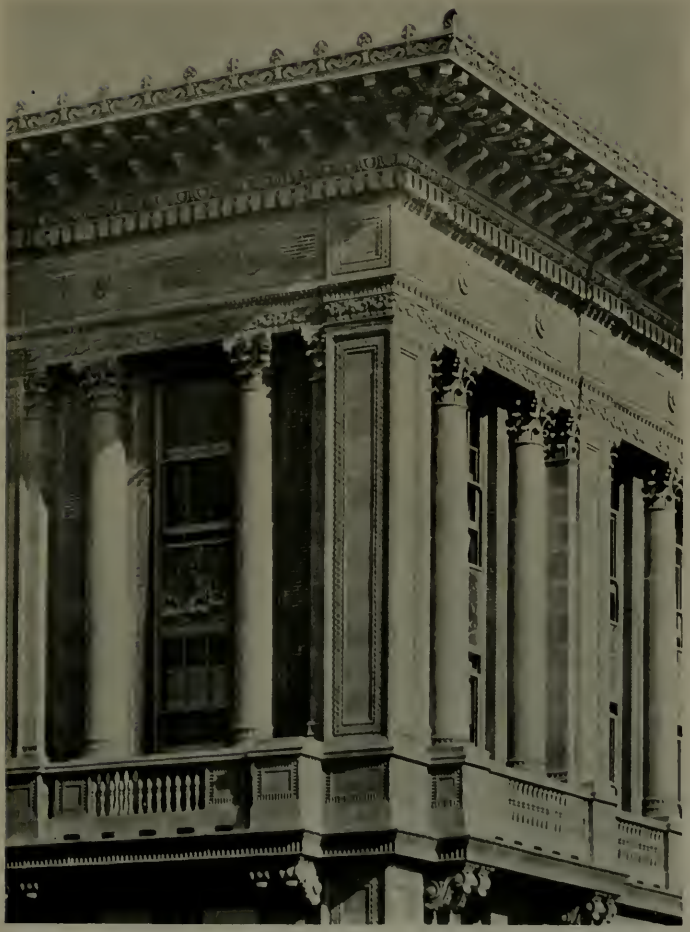
The building is planned in the form of the letter "E," being 275 feet on Market street, with the wings 210 feet respectively on Spear and Stenart streets, the elevators occupying the central arm.

DETAIL OF MAIN ENTRANCE AND SIXTH FLOOR BALCONY, SOUTHERN PACIFIC OFFICE BUILDING, SAN FRANCISCO

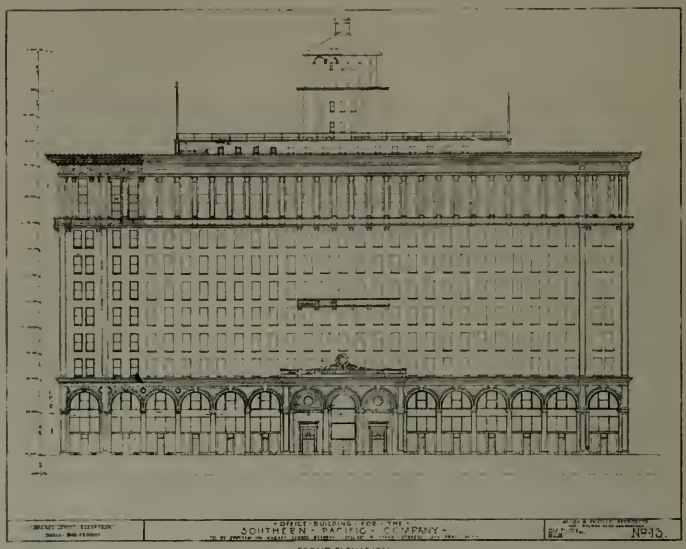
ENTRANCE, SOUTHERN PACIFIC OFFICE BUILDING, SAN FRANCISCO
Bliss & Faville, Architects

DETAIL OF ARCHES OVER MAIN ENTRANCE, SOUTHERN PACIFIC OFFICE BUILDING
Bliss & Faville Architects

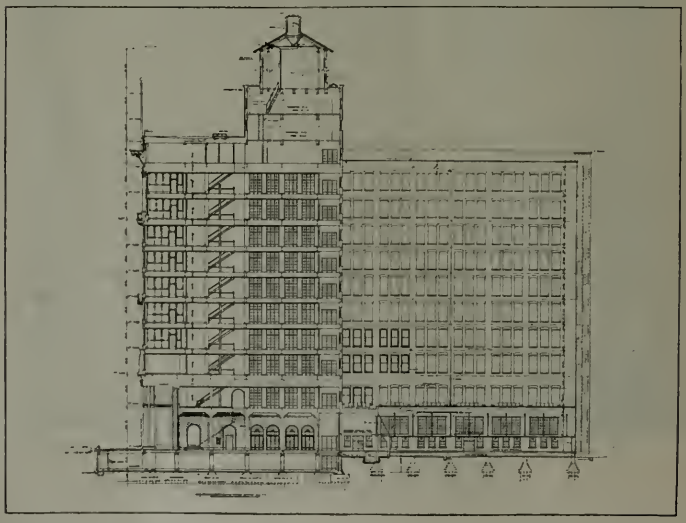
ELEVATION, SOUTHERN PACIFIC OFFICE BUILDING, SAN FRANCISCO



DETAIL, UPPER PART END PAVILIONS, BALCONY AND CORNICE
SOUTHERN PACIFIC OFFICE BUILDING, SAN FRANCISCO
BLISS & FAVILLE, ARCHITECTS



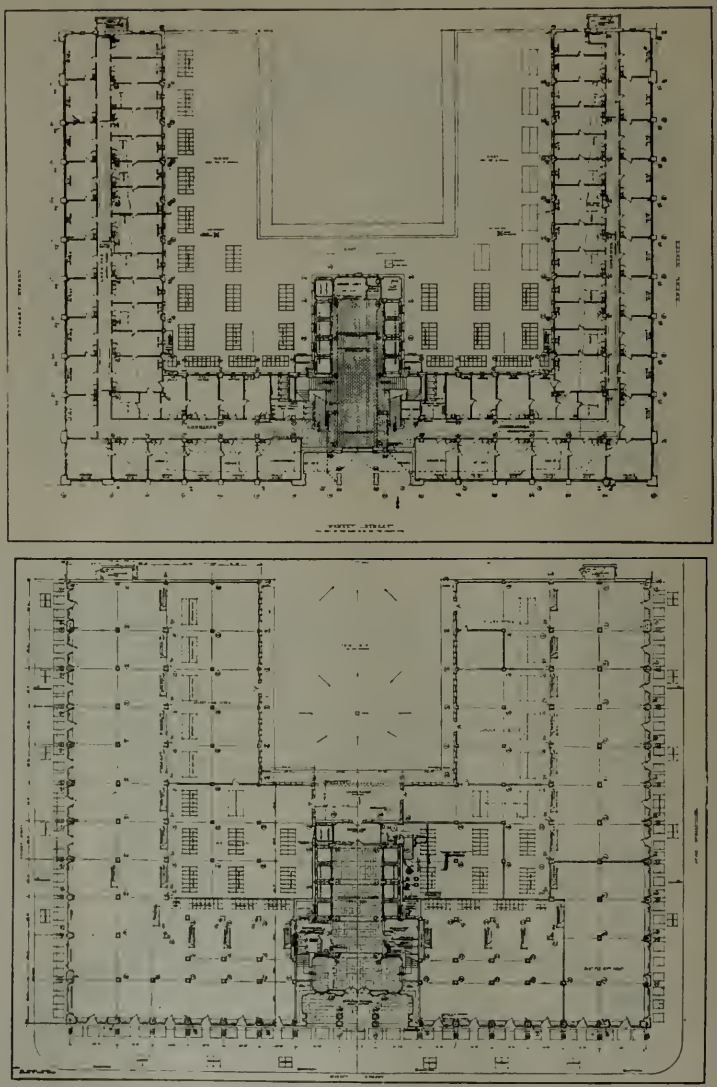
FRONT ELEVATION



ELEVATION AND SECTION, SOUTHERN PACIFIC OFFICE BUILDING, SAN FRANCISCO

DETAIL OF PAVILIONS, SOUTHERN PACIFIC OFFICE BUILDING

ELEVATOR LOBBY, SOUTHERN PACIFIC OFFICE BUILDING, SAN FRANCISCO



FLOOR PLANS, SOUTHERN PACIFIC OFFICE BUILDING, SAN FRANCISCO

FOUR VIEWS SHOWING OFFICE FORCES, IN AS MANY DEPARTMENTS, AT WORK

TYPICAL CORRIDOR, SOUTHERN PACIFIC OFFICE BUILDING, SAN FRANCISCO

On the street floor the Southern Pacific Company retains that portion which faces the court, while that portion facing the three streets will be rented in stores, except a limited space which has been retained for the district freight agent. The second floor is rented. The third, fourth and fifth floors are used almost entirely for the auditing department, with the various branches of the executive, operating and legal departments occupying the floors above, to and including the tenth floor. On the eleventh floor there is a dining-room, kitchen and library for the use of the women employed in the building, who will also have access to the roof, which will give them a promenade without being forced onto the streets for their recreation. This floor also includes the blue-printing establishment and rooms which are used for the pensioned veterans of the company.

The building is primarily a workshop for the Southern Pacific Company, and with the exception of the lobby, which has simple Colorado yule marble walls and ornamental plaster ceiling, there has been no attempt to make it other than an unostentatious, practicable building, embodying the needs of the company.

The entire building is provided with a sprinkler system, which reduces the insurance to a minimum and gives splendid fire protection.

* * *

Trite Sayings

The largest room in many a house is the room for improvement.

Some owners are like newspapers; they issue extras every few minutes.

A man is like a scaffold; the higher he gets the stronger he needs to be.

MILL BUILDING FOR THE CALIFORNIA COTTON MILLS, EAST OAKLAND
A. C. Griewank, C. E.

California Cotton Mills' New Building

By A. C. GRIEWANK, C. E.

THE new addition to the California Cotton Mills, situated in Oakland, California, was built by day labor and sub-contracts under the general direction of Messrs. J. R. Miller, Jr., manager, and A. S. Mitchell, superintendent of plant, the latter acting as superintendent of construction, the writer being the designer of the building.

The addition consists of a four-story mill building; exterior walls of brick, the front wall being finished with pressed brick, solid 8-inch wood floors, finished with 1-inch maple flooring, timber columns and girders, and concrete foundation. The first floor is of concrete on earth fill.

The building is equipped with a service elevator, sprinkler system, toilets and locker rooms on each floor. The new building added 105,000 square feet of floor space to the plant.

A pleasing exterior effect was obtained without extra cost by the use of concrete lintels over the windows and concrete coping on top of the parapet wall, which were painted white after being placed. Brick pilasters and the utility towers at front corners, in which a clock and medallion are inset, add greatly to the appearance of the building.

In Figure 1 is shown an unusual floor plan—namely, the use of the three utility towers—which leaves a clear floor space for manufacturing. Automatic fire doors and brick fire walls separate the towers from manufacturing space at each opening. In each utility tower is placed a fireproof stairway, which has a direct exit from the tower; also an entrance to each floor. Two of these stairs lead to the roof; this makes the circulation of entrance and exit from floor to floor, also for fire escapes, exceptionally fine.

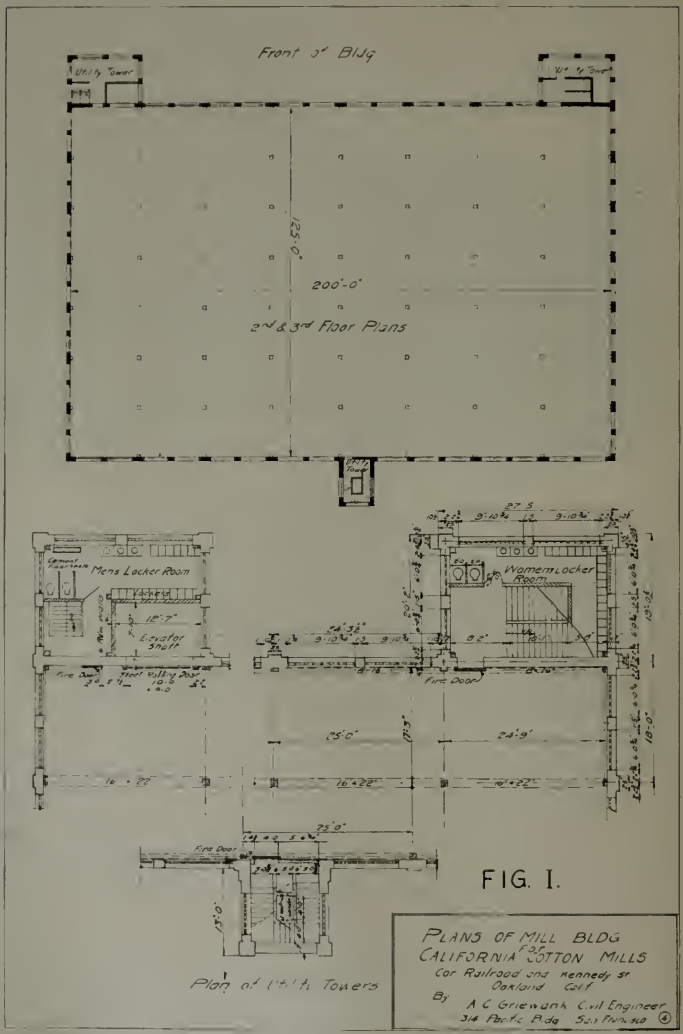

Front of Bldg
Utility Tower
Utility Tower
125'-0"
200'-0"
2nd & 3rd Floor Plans
Utility Tower
Mens Locker Room
Elevator Shaft
Fire Door
Womens Locker Room
Fire Door
25'-0"
24'-9"
16'+22"
16'+22"
25'-0"
Fire Door
13'-0"
Plan of Utility Towers
PLANS OF MILL BLDG
FOR
CALIFORNIA COTTON MILLS
Cor Railroad and Kennedy St
Oakland Calif
By A C Griewank Civil Engineer
314 Pacific Bldg San Francisco

FIG. I.

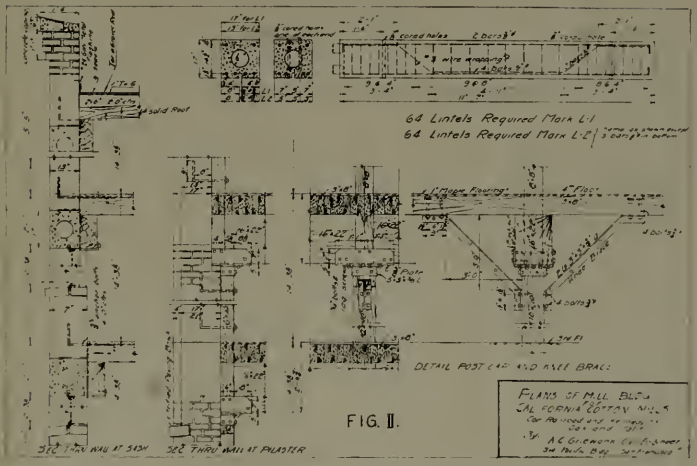
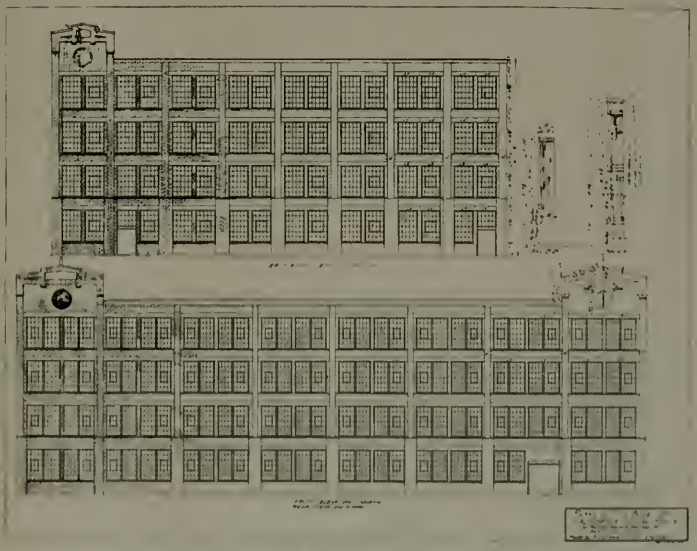

64 Lintels Required Mark L-1
64 Lintels Required Mark L-2
DETAIL POST CAP AND KNEE BRACE
PLANS OF MILL BLDG
CALIFORNIA COTTON MILLS

FIG. II.



DETAILS AND ELEVATIONS, MILL BUILDING FOR CALIFORNIA COTTON MILLS, EAST OAKLAND, CAL.

A service elevator is situated in one tower, while in two towers, on each floor, are men's and women's toilets and locker rooms. The floors and stairs of the rear tower are built of reinforced concrete, and they wind around a concrete conduit (4x3 feet), in which all electric wires are brought to each floor and in which all switches are located. A fire door is placed at the entrance to each switch-board.

One of the important features of the building is the abundance of light. Nearly the entire wall area on the four sides are Fenestra solid steel sashes with ribbed wire glass, which gives the maximum possible light for the openings. The interior surfaces are painted white, with a final coat of egg-shell gloss, which makes the light ideal.

In Figure 2 some of the typical details are shown. Those to which attention should especially be called are the post caps, specially designed to do away with the beveling of the ends of posts and girders, thereby facilitating erection. These were built from the writer's drawings by the Kortick Falls Manufacturing Company. The concrete lintels, which were precast as soon as the foundation was started, cost less than the brick work, which they replaced. Two holes were left in the lintels for handling and a groove in the bottom to allow them to set over the Fenestra sash. The concrete coping was precast and the balance of top of parapet wall poured in place. The girders run in one direction, and at the columns are steel knee braces at right angles to girders bolted into the 8-inch solid floor, leaving the ceiling between the girders clear for the full length of the building, which gives a minimum number of heads in the sprinkler system.

The foundation was started in January and the building was 90 per cent completed on June 1st, but owing to the fact that the machinery was not due for several months, the finishing of the building was not rushed.

The special construction features, which will now be described, are due to the ingenuity of Mr. Mitchell, superintendent of construction. The erection of all the girder posts and the hoisting of all lumber and concrete lintels was done by means of an especially constructed stiff-leg derrick, with a movable pole, operated by an electric motor, and the whole affair mounted on wheels. It was hoisted from floor to floor and moved about into position by its own power. This device appeared as though it would be cumbersome, but it proved to be very successful. The concrete lintels were all raised by this derrick to the floor above the sash, over which they were to set. They were lowered into place by a device named "the gun," which consisted of a pole mounted on two wheels; the lintel was suspended at one end, and was then moved out, thus hanging over the edge of the floor, and by tilting up the other end of the pole the lintel was lowered into place. The ends of the 3 x 8 inch solid floor were sawed off by means of a cut-off saw and an electric motor, which were mounted on a movable frame, and by pulling this frame against a guide, one man was able to saw off the floor the entire length of the building in less than one hour. All the interior painting was done from platforms built upon wagons, which were moved from floor to floor, thus doing away with all scaffolds.

Due to the fact that the floors were supported independently of the brick walls, except for anchors, the exterior brick walls were built after the floor above was started, making it possible for the brickmasons to have only a platform on low horses to work from, thus doing away with a great deal of scaffolding.

The total cost of the building completed, including sprinkler system, elevator, plumbing, electric wiring, etc., amounted approximately to $90,000.

Competitions

By W. GARDEN MITCHELL, Architect

THE State building competition was in its final analysis unsatisfactory. The casual critic will say in reply to this statement, all competitions are unsatisfactory—to the losers. This is not a true presentation of the case; some competitions are satisfactory, quite satisfactory, if not to all the losers, at least to a large number of them. They admit themselves beaten, or at least feel that the judgment rendered is as equitable as one can reasonably expect. I think it was so in the case of the City Hall; the losers, whatever they might have to remark in matters of fine points of individual preference, were, broadly speaking, contented with the selected design and bowed gracefully to the decision.

Not so with the State building. I am not discussing the merits or demerits of the design selected for the State building, but the dissatisfaction among competitors with the result of the competition, and as other competitions will arise, it is well that the reasons for discontent should be stated and discussed.

First there is the question of jury. As most of the architects competent to act as jurymen are liable to go in for the competition themselves, it is desirable that a jury of two drawn from the East should be employed, with an additional local layman added to prevent a tie. It may be a more expensive method, but in important competitions it is worth the additional cost.

By this method we can secure capacity and eliminate local partiality, jealousy, unfriendliness or other personal elements.

Second. A provision should be made in the programme that in the event of none of the designs coming up to the standard of excellence deemed necessary by the jury, all shall be rejected and certain prizes paid in liquidation of all obligations to the competitors. The proviso being added that all prize winners shall have the right to enter any subsequent competition for said building.

Third. All drawings submitted in competition, including those submitted in the preliminary as well as in the final competition, shall, with the consent of the competitor, be exhibited to the public, except that prize winners shall have no option in the matter, but must allow their designs, preliminary and final, to be so exhibited.

Fourth. That the jury shall make a written report, covering, if the competition is held in two stages, both stages, or if in one stage, then a report on that, stating precisely the process and reason of elimination, grouping the reasons into four, five or more heads.

1. Insufficient architectural merit.
2. Inferiority of plan, though fair in elevation.
3. Inferiority of elevation, though fair in plan.
4. Excellent in plan, defective in elevation.
5. Excellent in elevation, defective in plan.
6. Excellent in both plan and elevation, but entirely too extravagant in view of the appropriation.
7. Violation of conditions of programme, stating the violation.
8. Excellent in both plan and elevation.

The jury should state the number of hours spent in each stage of elimination, and finally state that in the last stage six or more designs were reserved for discussion, and that the voting on the last group comprising drawings Nos. so and so finally placed Nos. 10, 16, 25, as the case may be, in order of merit.

It is only fair that competitors should know something about the way they are treated, and as the jury cannot eliminate without reason there is nothing to prevent a stenographer taking down these reasons as the examination proceeds.

Competitions will be entered with more enthusiasm by the profession when the competitors feel that the award is made intelligently, carefully and honestly, and losers will know approximately where they ranked in the eyes of the jury, which is the least that should be offered in view of their labors.

* * *

COMPETITIONS FROM ANOTHER ANGLE

And while discussing competitions, the following editorial in the Building Review of New Orleans voices our views, especially with respect to the educational advantages to be derived from a well conducted competition:

"The process of holding a competition in order to determine who shall be the architect of a building has not received very enthusiastic encouragement of late years. It is thought that competitions, unless they are very strictly conducted, do not produce the best results. The American Institute of Architects has studied this subject very carefully and has drawn up a definite set of regulations governing the conduct of competitions, which if they are followed in good faith, will give results which are entirely satisfactory both to promoter and competitor. The opinion has been growing, however, that a competition is seldom necessary, and that it is much better and far simpler to employ a capable architect outright and trust to his known skill and good judgment.

"However much may be said against competitions, we believe that they do good in advancing the standards of architectural design; this much may certainly be affirmed in their favor. When competitions were in vogue the architectural magazines were much more interesting than they are today. The publication of the designs submitted by prominent and talented architects to which the presumption is they had given their best thought toward the working out of a plan for some important building or group of buildings, gave an opportunity to compare and contrast the respective merits of their solutions, and from an educational standpoint there is no more profitable exercise than this. Here was an opportunity for designers to work out new ideas and for students to learn, not only what their new ideas were, but also gain new points about rendering and presentation.

"The indifference that architects show toward competitions is based very largely on past experiences. Many of them have thrown away an appalling amount of time on competitions which were proven to be unfair and unjust and without intent on the part of their promoters. The intent of the rules drawn up by the A. I. A. is to give assurance that the real object of the competition is to select a design, and that the author of the design will be the architect selected to do the work. No promoter who is acting in good faith could have any objection to the Institute's regulations, since his own interests are entirely safeguarded, and the competitors on their part would also be satisfied to enter their services.

"We repeat that the educational advantages of competitions are very great. They help to advance the standards of design as a whole, they spur on the architect himself to greater efforts in his profession, they often bring to the front obscure men of genius, and last, but not least, they add immeasurably to the interest of the current architectural magazines."

* * *

STATE BUILDING COMPETITION

Official announcement is made elsewhere in this issue of a competition for two new State buildings to be erected in the city of Sacramento and to cost $3,000,000. The competition will be conducted in two stages, the first stage being open to reputable architects throughout the United States. The second stage will comprise ten architects selected in the first competition. Applications for the programme should be filed before December 15 with the Architectural Advisor, Mr. George B. McDougall, Forum building, Sacramento.

Washington State Capitol Building Controversy

THE Washington State Chapter of the American Institute of Architects is much opposed to the announced purpose of Governor Lister and the State Capitol Commission to erect an office building in the middle of the group at Olympia called for in the previously accepted plans. Prompted by an artistic sense alone, they desire to see the original plan carried out. It is their conception that the great State of Washington, with ample means at its command, shall not have plans that have been the result of the best architectural thought of the country rendered hideous and unsightly by the substitution of utilitarian and inartistic plans of the Capitol Commission.

The group plan of buildings for the proposed new capitol is easily adaptable to the growth of the State's business, while preserving the symmetry and artistic effect. The roof of the proposed central building of the group is surmounted by a beautiful dome somewhat similar to that on the national capitol. It appears to be the plan to place an office building in the place assigned to this structure, thereby abandoning the plan as a whole. It is on this that the architects are centering their efforts and asking the public to join in the fight.

For many years there was a continuous and bitter controversy over the style and arrangements for the proposed buildings. Governor McGraw started a capitol building in 1893, spending $200,000 on it. Governor Rogers brought work on this site to an end and urged the purchase of the Thurston county court house. The court house and additions made are now in use as the state capitol building and are no longer adequate for the purposes of the State.

The first definite policy came into existence through the efforts of Governor Hay in 1911. Leading architects of the country were invited to submit competitive plans. Thirty architects from various parts of the United States responded and the first award went to Messrs. Wilder & White of New York. This has since been considered the fixed and definite plan upon which the State would build when it should begin the enterprise of erecting the buildings. The Temple of Justice was planned and built as a part of this group. While it is not yet complete, it occupies the position to which it was assigned in the Wilder & White plan. The latter plan appeals to everyone with a love of the beautiful in architecture, the unsightly water front being made over to conform in every sense to the general scheme. Now comes the Capitol Commission with authority to modify, but instead of modifying proposes to wreck the entire plan, abandon the water front approach and have a plain office building facing Main street.

Several states have gone through just such controversies as the one now raging in Washington and many serious errors have been made. But in no case has the result been satisfactory either from an artistic or utilitarian standpoint except where a well-established plan has been followed.

When the French engineer, Peter Charles L'Enfant, laid out the plan for the capitol at Washington, D. C., many objected to following out the precise recommendations. However, those who desired to see something dignified and beautiful as a capitol building were in the majority, so that today Washington is the world's most beautiful city.

It is contended by the architects that such interference with a broadly conceived and partly executed plan—a plan so commendable as to receive hearty endorsement by those architects who were unsuccessful in the competition—would be deplorable even if radical change of conditions made it necessary, but no such change has risen. The Wilder & White plan provides sites for buildings of whatever kind may be required without, by utilization of the central location for a subordinate building, making forever impossible a group so incomparable for nobility and imposing interest.

HOUSE FOR MR. A. G. WISHON, FRESNO. EXTERIOR OF ASBESTOS STUCCO
Coates & Traver, Architects

High Water Mark Reached in Cost of Labor and Materials

WHILE the material and labor situation is still acute, there is every indication that it has about reached the high water mark, and that a recession may be expected in the near future, says the Building Review of New Orleans. There is no reason to doubt that an improvement in this direction will tend to release many building plans that have been held in abeyance. With the completion of government cantonments, the labor withdrawn from building centers will return to normal channels. The present propaganda to prevent further increase in food prices, the effort to minimize waste and other Governmental measures will certainly have a restraining effect on the further advance in the cost of labor and materials, and once the market is stabilized the prospective owners and tenants will adjust themselves to the reduced purchasing power of the unit dollar.

The situation just at this time is well illustrated by a prominent New Orleans architect, who had prepared plans for one of his clients to build on a $14,000 plot of ground in the commercial district. There was in prospect a tenant for the property, who had agreed to pay a rental of $500 per month; and if the building could have been erected for $45,000 or $50,000, as was anticipated, this would have represented 10 per cent on the investment. But an estimate submitted by a leading contractor called for an expenditure of $81,000, which was considerably more than the owner thought justified by the contemplated revenue from rental. The result is that the job is now hanging fire.

Notwithstanding this situation there has been sufficient construction work to maintain the balance of the building trades, particularly in the way of manufacturing establishments whose swift expansion has demanded increased equipment, and with the readjustment of capital and labor to the changed conditions which are natural concomitant of a country at war we may expect to enter a building era that will be unprecedented in the history of our nation.

An Awakening in Garage Architecture

THE main contact point between the modern revolution in transportation and the building industry is the garage. And for many years this contact point was not highly regarded by the building industry. In fact, the common attitude was to ignore it. The garage in its humble origin was too insignificant to command respect. It was classed with various small outbuildings of a farm or estate, tolerated but not recognized.

Then a few architects began to harmonize the lowly housing of the automobile with the stately residence, and it gained an artistic standing on the estate. And commercially the necessity for the public garage grew apace and many were built, just for the rentals they would yield, with no effort at style or distinction, or even special fitness for their purpose. Plain housing or shelter and an avoidance of trouble with the city building inspector seemed to be the main considerations. And to please the patrons little trifling conveniences were provided, one after another. But the garage remained an eyesore, generally speaking, a thing publicly despised as a cheap upstart, but accepted for its unavoidable utility.

But lately the garage has been coming into its own kingdom. It is receiving not only public attention, but the public's more distinguished consideration. Like the carpenter who has become a big general contractor, the garage has acquired a new status. It is being received into the best business circles and its wants are listened to and heeded.

Hereafter the garage can hold its head erect among the best types of business structures. It will unfold many marvels of appropriate use and develop into a unique and most essential building. The enormous increase in the use of automobiles has compelled the building industry to give this final and complete recognition.

The type of public garages under construction today are incomparably superior to their predecessors of yesterday. They are built most substantially, often of concrete, metal or masonry, and are equipped with various modern fire preventive devices. They are built several stories or more in height. Access to the upper floors is gained not by means of elevators but by a system of ramps, extending from the main entrance on a ten or fifteen per cent grade, built of reinforced concrete. It is thus possible for the renter to speedily and safely get to, say, the fourth floor of the building with his machine. The ramps are of sufficient width for two cars to pass and in the center of the ramp longitudinally is a raised edge to prevent the possibility of a collision.

And there are all manner of devices to hasten dispatch. If a man wants his car, the number is flashed by electric light, so that it will be ready in a very few moments. And all kinds of electric checks and conveniences have been introduced.

Another of the recent acquisitions is an added privacy. The garage is divided into compartments or spaces, perhaps 10 by 22, with cement floors, electric light, steam heat and running water. The renter gets a key to his compartment, and may come and go at any hour without consulting anyone. The compartments in series of four each may be separated from each other by fireproof walls. The owner may take care of his machine or may engage an attendant to look after it. In brief, the garage is gradually taking on the qualities and the conveniences of a good hotel. And architecturally it is acquiring distinction.—American Contractor.

BERKELEY TENNIS CLUB'S NEW HOME, BERKELEY, CALIFORNIA

BERKELEY TENNIS CLUB'S NEW HOME, BERKELEY, CALIFORNIA

CLUB HOUSE AND COURTS, BERKELEY TENNIS CLUB

New Home of the Berkeley Tennis Club

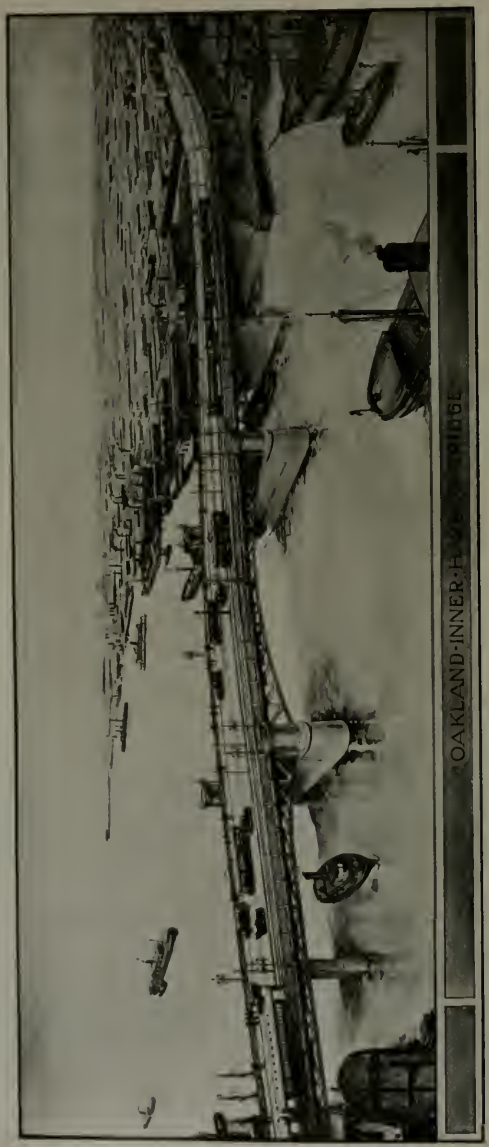
THE Berkeley Tennis Club has recently taken possession of its new house and grounds on the Tunnel road at Domingo avenue, Berkeley, the improvements having been carried on under the direction of Mr. Frederick Whitton as construction manager. Fifty thousand dollars has been expended in building an attractive club house, grand stands and cement tennis courts. The club house has been so designed that the progress of the games may be watched from its spacious verandas with an unobstructed view. The house possesses a homelike charm with architectural lines suggesting the Colonial. The building covers a ground area 150x40 feet, with an immense lounging room on the ground floor, 60x40 feet, that can be conveniently turned into an amusement room for dances or entertainments. The floor is maple. A large, old-fashioned rustic stone fireplace, a flush wall arranged for handball playing, a stage with footlights and scenery for amateur theatricals, are some of the features of the "big room," as the members have appropriately dubbed it. The roof has open truss work artistically finished in Oregon pine.

The lounge contains the office and enters onto the porch which overlooks the grounds. A feature has been made of the locker and shower rooms. They are ample in size, well lighted and ventilated and will accommodate 250 persons.

The second floor extends over the center portion of the building and contains a large kitchen, serving pantry and a 30x30 foot dining-room with fireplace finished in pine. Opening off from the dining room is an outdoor balcony which overlooks the courts.

The outside walls, up to the water table, have heavy, rough redwood siding. Above this to underside of eaves the walls are covered with extra heavy cedar shingles stained gray and laid 6½ inches to the weather. All exterior trim is of redwood painted white. A massive rustic stone chimney shows on the south side.

There are ten tennis courts. All are paved with a concrete base and asphaltum top and empty into an elaborate system of subsoil drains. The courts are enclosed with 12-foot high wire fences and redwood posts. Two of the courts are arranged for exhibition playing, the grand stands having a capacity of about 2,000 persons. The wire fence at the exhibition courts is so built that it can be removed during exhibition tournaments. The courts are on different levels, being retained by heavy concrete gravity walls.


OAKLAND·INNER·H

Oakland-Alameda Bascule Bridge

IN conjunction with Mr. P. A. Haviland, County Engineer of Alameda county, the Southern Pacific Company's engineers have completed the preliminary plans for the new $1,500,000 joint estuary bridge which is expected to be a monument to the cities of Oakland and Alameda, to bring a wonderful development of traffic between Oakland and Alameda, to relieve the present congestion and delays on the roadway of the antiquated Webster street bridge, and, as well, greatly improve navigation on the channel, permitting freedom of movement of the largest vessels and dreadnaughts through the San Antonia Estuary.

The plans indicate that the new bridge will be an imposing and artistic structure, embodying the highest engineering skill, and providing metropolitan facilities for the great growth of the bay cities which the future holds, and because it is a joint bridge the structure will be built on a much larger and more elaborate scale than either the county or the company could otherwise have considered, if they had elected to erect separate bridges.

Several months ago, when a public hearing was held by Lieutenant Colonel Thomas H. Rees, the Southern Pacific offered to co-operate in any plans that might be suggested by the War Department of the United States in aid of navigation and agreed to reconstruct the Harrison street bridge accordingly. The project of erecting a joint bridge was afterwards suggested and a number of conferences between the county officers and officers of the Southern Pacific resulted in the present plans.

Considering the magnitude of the undertaking, the preliminary negotiations were completed in record time, and the Southern Pacific Company joined with Alameda county in a preliminary agreement on April 23, 1917, for the construction of a new joint double leaf bascule bridge. The War Department has approved the engineer's plans and the county's share of the expense will be provided by bond issue, already authorized.

It will take some months to get the detail plans ready and the material for construction, but work will start this winter and it is hoped to have it finished by the fall of 1918.

By joining in the erection of a single bridge of the most modern design, Alameda county and the Southern Pacific will be able to supplant the two drawbridges now doing service at Webster and Harrison streets, and navigation will thus have only one bridge to contend with instead of two, in addition to which the old center piers will be entirely removed from the channel.

The Southern Pacific portion of the new bridge, with double track, will have a capacity of six times that of the present Harrison street bridge and will take care of the railroad traffic for generations.

The highway portion will include a roadway 30 feet wide, with a sidewalk 10 feet in width. The calculated capacity of this roadway is about 2,500 vehicles per hour in each direction, which is twenty-five times the present highway traffic.

From the standpoint of safety and non-interference with traffic, the new structure will be admirably designed. It will start at Fifth and Webster streets and run on an elevated plan, crossing above all the streets and railroads between that point and the estuary, and will also cross above all streets in the neighborhood of the bridge on the Alameda side, thus eliminating possibility of accidents at crossings, and facilitating the movement of traffic.

As the structure will be about fifty feet above the water, tugs, barges and other small vessels will be able to pass without the necessity of the bridge being opened. When the bridge does open, 3,000 tons of concrete and steel will move majestically, apparently without effort and guided by unseen hands. When completely opened, the two enormous leaves, 76 feet wide, will each extend about 150 feet skyward and will present a novel spectacle. They will be seen for miles around.

The foundation of the estuary bridge will be no light undertaking. The water is 50 feet deep at that point, and it will be necessary to lay the foundation bare by some one of the cofferdam methods in order to place the concrete foundations in a proper and substantial manner.

The Southern Pacific Company has already accomplished some remarkable bridge construction on the Pacific Coast. Its swing bridge at Sacramento, which weighs 3,200 tons, and its vertical lift bridge at Portland, which weighs 2,250 tons, are the heaviest bridges of their kind so far constructed, while the company's bascule at San Pedro was the largest of that type when built. The present Harrison street bridge was constructed in 1898 and is still in first-class condition. This bridge opens for boats as many as ten times an hour, and a train is scheduled to pass over it every four minutes.

* * *

Powers of the State Board of Architecture

IN his annual address, Mr. J. E. Allison, president of the Southern California Chapter of the American Institute of Architects, quotes a suggestion made by a member of the chapter in a letter written to President Mauran of the American Institute that the California State Board of Architecture should require all licensed architects to observe the canons of ethics and practice of the profession as laid down by the Institute. Mr. Allison commends the suggestion to the state board for favorable consideration, "provided there are no legal obstacles."

The writer of the letter, who makes the suggestion, infers that powers to require all certificated architects to subscribe to the canons of ethics and practice of the Institute lie with the state board because the law requires that members of the state board shall be members of the Institute. He further assumes that they have the power to carry out the suggestion because the law leaves it entirely to the members of the board to make their own regulations for the examination of applicants for licenses to practice architecture.

The state board has probably not overlooked any powers which it might lawfully exercise in throwing restrictions around the practice of architecture which might inure to the benefit of the profession. In the enactment of the law the American Institute of Architects was recognized in determining appointments for the state board because its conditions for membership furnished the only tangible standard of qualifications then existent for competency in the practice of architecture. There is no law in any state licensing professional men, so far as we are aware, that imposes upon registrants the observance of the rules of any society or organization, however desirable such a requirement might seem to the members of any profession.

It is regrettable that the status of the architect is not more clearly defined in the public mind, especially since the state has deemed it expedient to enact a law regulating the practice of architecture. It is desirable that the province of the architect and the province of the contractor should be more fully and more definitely understood by the public. Whether this can be accomplished through the medium of legislation may be an open question. An enlargement of the powers of the state board is legally possible but such an extension of powers rests with the legislature of the state and not with the state board of architecture.

PORTFOLIO OF PHOTOGRAPHS OF THE FRIEZE IN THE MAIN ENTRANCE LOBBY OF THE CALIFORNIA THEATRE

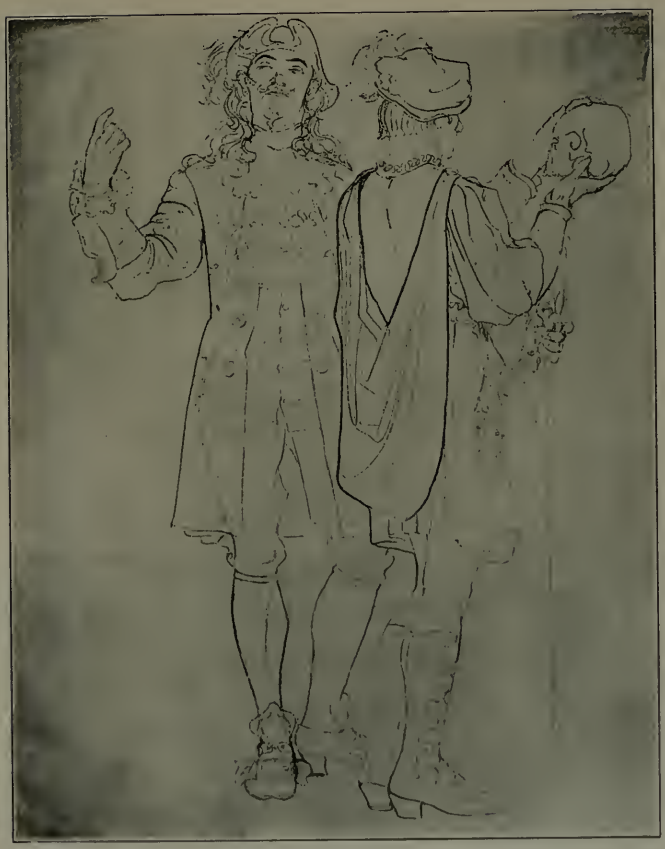
PAINTED BY RAY F. COYLE

CARTOON FOR FRIEZE, CALIFORNIA THEATRE

DOMINANT MOTIF OF CENTRAL PANEL OF FRIEZE IN THE MAIN ENTRANCE LOBBY, CALIFORNIA THEATRE

PORTION OF CENTRAL PANEL OF FRIEZE IN MAIN ENTRANCE LOBBY, CALIFORNIA THEATRE

CARTOON FOR FRIEZE, CALIFORNIA THEATRE



CARTOON FOR FRIEZE, CALIFORNIA THEATRE

CARTOON FOR FRIEZE, CALIFORNIA THEATRE

CENTRAL MOTIF LEFT HAND PANEL OF FRIEZE IN MAIN ENTRANCE LOBBY, CALIFORNIA THEATRE

OVER MANTEL FOR LADIES' DRESSING ROOM, CALIFORNIA THEATRE

BUNGALOW OF MR. JOHN A. DUNFORD, SEATTLE
W. R. B. WILLCOX, ARCHITECT

FIREPLACE IN LIVING ROOM, BUNGALOW OF MR. JOHN A. DUNFORD, SEATTLE
W. R. B. Willcox, Architect

A Bungalow Adaptation of the Swiss Chalet or English Style of House*

THAT a bungalow lends itself to any style of architecture is clearly shown in this house. What has been successfully accomplished here could be made a dismal failure if attempted by a designer unfamiliar with the periods used. Unusual skill is required of the architect who desires to use the bungalow in the expression of ideas common to any one particular period. Even greater ability is needed where one combines the details of two periods.

The success with which Mr. W. R. B. Willcox of Seattle, Wash., handled this difficult problem is ably illustrated in the accompanying photograph of the exterior. The lot was narrow, 35 feet, and as a result, if one was to obtain a large living room the room would have to extend across the full width of house. There was but one solution for the roof and that meant a ridge perpendicular to the street. With the roof line determined, the treatment of the end necessitated a good deal of study. The verge board naturally was the first thing to demand attention. A plain board would add no particular interest to the front, consequently the designer must have recalled some of the little Swiss cottages he had seen. The detail was recalled and placed as you can see. The verge board is frankly built of two pieces. The upper board being of one and seven eighths inch stock, while the lower board

*Courtesy of Bungalow Magazine.

LIVING ROOM, BUNGALOW OF MR. JOHN A. DUNFORD, SEATTLE
W. R. B. WILLCOX,
ARCHITECT

KITCHENETTE IN SEATTLE BUNGALOW

is cut from one and three-fourths inch stock. The bay too is the result of foreign influence.

The half timber most effectively adorns the bay and adds the final touch to the exterior. The beams and verge board as well as the trim have all been given a coat of brown stain. The siding has been painted dark gray and the plaster between the beams is of a light gray color. The colors all combine with the style to make this one of the little gems of the neighborhood.

Located on Phinney Ridge, Seattle, it is in the midst of a group of mediocre bungalows, all common and alike in style. Truly individual and distinctive in character, this home has much to commend itself.

The plan is well arranged. The little entrance porch, 5 feet by 5 feet, is just large enough to meet the requirements of an entrance door. One enters directly into the living room which measures 18 feet by 10 feet exclusive of the bay, which is two feet wide and fifteen feet long. There is one other feature which also adds to the size of this main room of the house, and that is the recessed fireplace. The result is that the fireplace does not reduce the room as is the case in the average house. This nook measures 9 feet 6 inches across and is 2 feet deep

FLOOR PLAN, BUNGALOW OF MR. JOHN I. DUNFORD, SEATTLE
W. R. B. Willcox, Architect

DINING ROOM, BUNGALOW OF MR. JOHN A. DUNFORD, SEATTLE
W. R. B. WILLCOX,
ARCHITECT

in the clear. Bookcases are built in on either side of the fireplace and they, too, show that care has been taken in the planning. The mantel fits snugly into the recess provided for it, and being carefully detailed it has an additional feature to add to its attractiveness.

Study has resulted in the most satisfying proportions being obtained and these points all combined are responsible for pleasing results obtained. There is one distracting thing about this picture and that is the fact that the mantel is overloaded with pictures. The effect of the whole would be much more charming if the mantel was not so littered with photographs.

The lighting of the living room has been carefully considered. There is one large window on the east of the room and five to the south, practically making the room as light as possible and still providing wall space for furniture, a point always to be considered.

The dining room opens through one large French door from the living room, and is provided with two windows, one to the south and one to the west. This room measures 12 feet by 12 feet 6 inches. The ceiling treatment is out of the ordinary owing to the fact that the house has been kept as low as possible. The plaster on the west side of the house has been applied directly to the roof rafters, and the ceiling on the east side of the room has been furred down to correspond. The ceiling has been further enriched by two massive beams at the intersection of the flat portion of the ceiling with the sloping part. Interspaced are the lighter beams, which appear to carry the ceiling proper. The buffet is simple and its lines somewhat severe owing to the desire to keep the cost down, the trim being simply what is commonly known as bull nose.

A simple plate rail, in keeping with the remainder of the dining room, has been carried all about the room at a height of about 5 feet 8 inches. This rail, spaced at the proper height, has much to do with the appearance of the room. It very properly divides the side walls into the right proportion and assists in adding to the height of the ceiling, which is otherwise low.

Before leaving the dining room we wish to call your attention to the inadvertent omission of the one window to the south, which is not shown on the plan. This window shows on the elevation under the porch.

The hall has to be used as a passageway from the kitchen. In the original plans of the architect the dining room space was occupied by an entrance hall and a breakfast nook. The entrance door, being where the south dining room window shows, opened into a vestibule, which was provided with a coat closet. Directly back of the entrance hall was the breakfast nook and that was equipped with a china closet, the present buffet, which extended across the full length of the alcove. After the work had been started, the owner decided on the change, and the necessity for using the hall as a passage between the kitchen and the dining room resulted.

The kitchen, as explained by the photograph, has been provided with plenty of cupboard space, well located with a view to saving steps. The room measures 9 feet by 10 feet. Two large windows over the sink and a large pane of glass in the door permits an abundance of light to enter at all times of the day. The basement is entered by means of the rear porch. This porch is of a semi-enclosed nature, being enclosed by a simple lattice treatment, which can be observed in the exterior photograph.

The bedrooms are both the same size, 10 feet by 12 feet. The front room is provided with two small built-in closets on either side of the fireplace and one large closet. Two windows spaced with but a mullion between allow for ample light and ventilation. The wall space has been well taken care of, so that the furniture can be altered to suit the occupant. The back bedroom has

one more window than the front room, and is provided with a closet of the same size.

The bathroom in this compact home is 8 feet long by 5 feet 6 inches wide, just large enough to serve its need and no larger. The window is located near to the basin, with the result that there is no need for artificial light during the day. A large linen closet is cut off the closets, as shown on the plan.

The woodwork or trim throughout the house, with the exception of the kitchen, has been given a dark brown stain and waxed, and the walls and ceiling were sized and kalsomined a light cream in the living room. In the dining room the ceiling is light and the walls a tan. The walls of the bedrooms are both done in a light tan.

The exterior of this unusual home is such that in departing one cannot refrain from commenting again upon skillful handling of the problem. The difficulty confronting the architect is suddenly appreciated; more especially is this true when one attempts to design something really effective for a narrow lot.

* * *

Passing of Mr. Theodore Starrett, Builder

SAN FRANCISCO architects and others interested in building construction will be shocked to learn of the recent death of Mr. Theodore Starrett, one of the founders of the Thompson-Starrett Company, which played such an important part in the rebuilding of San Francisco after the fire of 1906. Mr. Starrett came to the Coast immediately following the catastrophe of that year and with his splendid organization took charge of the erection of many of the city's largest buildings. Mr. Starrett died at his home in Prospect Plains, N. Y., after less than a month's illness with apoplexy. He was born in Kansas, about fifty-three years ago, and received his education in the public schools, the University of Kansas and the Lake Forest University of Illinois. His mother is widely known as an educator and is the author of numerous books for girls.

The early building experience of Mr. Starrett was obtained in the offices of Burnham & Root, builders, of Chicago, where he was placed in charge of important operations involving immense expenditures. His first really notable work was as one of the engineers engaged in the construction of the World's Fair buildings in Chicago, after the completion of which he journeyed to New York City, imbued with ideas as to the future possibilities of skyscraper construction.

About twenty years ago he was instrumental in founding the firm of Thompson-Starrett Company, which since has made for itself a national reputation in the erection of modern steel-skeleton skyscrapers and public and semi-public buildings in all parts of the country. He retired from this concern about seven years ago in order to undertake building construction independently.

During his active building career, Mr. Starrett erected more than one hundred and fifty fireproof structures in New York and other large cities. He was particularly proud of his achievement in the construction of the railroad terminal at Washington, D. C., and the station for the Pennsylvania Railroad at Columbus, Ohio.

Mr. Starrett was a member of a large family of contractors and builders, all of whom have become prominent in their respective lines. He was the brother of Major William A. Starrett, Constructing Quartermaster General of the United States Army, in charge of the construction of army cantonments and the chairman of the Committee on Building Construction of the Council of National Defense. Another brother is Paul Starrett, president of the Geo. A. Fuller Company, builders. Goldwin Starrett, head of the architectural firm of Starrett & Van Vleck, and Ralph Starrett, of the firm of Starrett & Gross, builders, are other brothers.

Interior Decoration—The Dining-room

DINING-ROOMS have had vast power in fashioning the human race; to understand them is in part to understand history, to construct them an art. Originally formed for the ceremony of the dinner, the feast, much of this feeling lingers, confusing the earlier idea with the function of the room today. Not until the last century did the room become breakfast, luncheon and supper room as well, a common meeting ground of the family, the spot dedicated to gaiety and cheerful conversation, where care forgets to enter and in which personal grief and petty annoyances are laid aside. For this reason the note of stimulation in color, of lightness and airiness in design, and withal a certain restful quality is the one sought in the furnishings and decorations of this room.

It must be recognized that the dining-room shall be planned to fit the special house for which it is to be a part in style and finish. The particular needs of a particular family must be met, and if hospitality is the rule of the house, then the equipment, however simple, should be generous in quantity; if there is maid service the needs of the waitress should be considered,—if such service is lacking the room should be so simplified that every extra dust-collecting surface is absent. The plate rail should vanish, the sideboard with its boastful load of silver become free, all things seldom or never used go into banishment, and only those objects remain that are harmonious with the design of the room. Fitness for use and the useful made beautiful—this is the first law.

The size of the room should be as large as space permits, whatever the size of the family, for spaciousness creates a quality of rest. In the small house and apartment this effect of quiet largeness can be brought about through a judicious panelling of the walls, the use of mirrors, extreme though warm delicacy in coloring and an entire absence of every unnecessary object. At this point arises the question of mirrored cabinets for glass and chinaware—those cabinets with glass shelves piled high with choice china. Are they necessary, are they decorative, do they advance the balance and sense of proportion in the room? Common sense urges convenience, and if lack of closets demands that dining-room space be utilized, then let the architect be consulted and the useful be made a harmonious part of the room as a whole; let the windows be balanced by simple yet good-looking shelves fitted with doors, or let the hearth be flanked by these same shelves that appear to add to its dignity. The same idea governs the built-in sideboard, too often built out of all proportion to the size of the room in which it holds a dominant part. The gas log, in the apartment, seems totally unnecessary in the great heat given out by the radiators. Can it be treated, made good to look upon? If filled in, after the Japanese manner, the burner removed and perpendicular slabs of wood made to enclose a light silk textile rising to the ceiling, the room is transformed.

There are numerous aids for the dining-room that is permanently free from maid service. Built-in shelves may be fitted with a sliding drawer that runs through the wall and into the kitchen. With a lazy Susan, a double-decked table wagon, and one or possibly two tables with double shelves, a dinner can be charmingly served and the hostess remain seated. For daily needs, the careful wiring of electricity is a tremendous help. The connections can be cunningly hidden in the baseboard, for use at the side table; or they may be placed in the floor in the center of the room where they are no menace to the rug. If the rug is taken to a good establishment, it may be slit for a small space and cleverly bound; later when desired elsewhere the same firm can restore it perfectly. These aids for solving the question of the hour are becoming daily more important as the scarcity of house service grows, and they are especially useful where the occupations or pleasure of the family demand an elastic breakfast hour, and where the late comer enjoys the toast, the coffee pot and the little stove for breakfast bacon.

The separate breakfast table in the alcove of the larger dining-room is a distinct delight; often in summer it is moved onto the open porch and overlooks the garden. In the room where this smaller table is given up to breakfast and luncheon the dining-table takes its ancient place once more and becomes the crowning feature of the room. It is the triumphant end for which kitchen and pantry exist. Upon it falls also the law that it shall harmonize with the scheme of the room; if the wood finish is oak, the table accordingly becomes oak. Shall it be round, square or oval, and shall it have four legs or a pillar? A table supported by four legs has at times the uncertain quality of seeming to own a dozen; where more than four persons are seated, some one of them must unobtrusively yet painfully divide himself, and his polite and smiling agonies are seldom noticed by his host. Recently, there has been built a table where the four legs are placed so nearly in the corners that the most distrustful guest is reassured. The round table with the central pillar, four and a half feet in diameter, seats six people easily and is most serviceable, yet the design has to be chosen carefully lest the mechanism demanded for its enlargement make it clumsy. In a small family it is better to rely on the separate wooden tops, either oval or round in shape, than to buy a table that will extend.

However artistic the tall oak or walnut chairs may be they become dangerous ambuscades to the waitress which she dodges and from which she thankfully escapes. Far more practical is the chair with a back not over two feet nine inches high, and especially should the depth of the seat be carefully watched, for comfort in a table chair is impossible where the backward slant is more than three or four inches, and the heels of the person therein do not rest upon the floor. The occupant of the chair should be unconscious of his position.

Often, for various reasons, a screen is a shield to the pantry door. In simplicity, shape and color, this should conform to the entire interior of the room; never should it be the article first seen—and as a caution it may be taken as a maxim that the dining-room best planned needs no screen.

The power of decoration is one of the uses of the sideboard, provided the latter is in proportion to the room; too often the impression of an otherwise beautiful sideboard is that the room cages and makes it look out of place. The console, rather than the sideboard, is a better choice in the small dining-room, yet where conserve dishes, or a simple bowl of fruit and a pair of graceful candlesticks stand upon it, the sideboard yields a distinction to the room.

Windows may be draped with delicate net hangings reaching to deep window sills, or with light colored silken draperies that draw together in quiet folds and shimmer in the candle light.

If harmony is established between the individual and his surroundings through the courage to eliminate and a knowledge of values, the dining-room in every household will be a success.—House Beautiful.

*
* *

Adding Insult To Injury

We learn from the London Builder that much satisfaction has been caused in Belgian circles in Holland, according to a Central News telegram from Amsterdam, by the German statement that the Germans do not intend, as was at one time reported, to undertake the rebuilding of Louvain. The Echo Belge remarks that it is bad enough that the Germans should have destroyed Louvain, but for them to rebuild it in the German style would be even worse.

The Remodeling of Old Houses

HERE and there one finds an architect who has such an appreciation of the beautiful in the old houses as to be able to see their possibilities and eagerly rescue from the demolisher's hands these abodes of 50 years ago. They realize that such houses have frames which will never be duplicated by modern builders—that their foundations are more solid than any which are built today. Those seasoned beams will outlast, by half a century, the timber being put into modern houses.

The real artist shudders when he sees them being torn down. He sees a chance here to lengthen a line, there to take out a partition; he adds a sweep to the roof, puts in some dormer windows on this side, curves the roof here and adds a porch, until, presto! that ugly old cottage, with its peaked roof and straight line, becomes a thing of beauty. All the old solid frame is kept, the foundation is undisturbed, and yet the beautiful lines of an older period have been added, transforming ugliness into beauty.

Into such a transformation scene a representative of The Christian Science Monitor recently stepped, in one of Chicago's flat suburbs. As one entered the house, one heard a soft purling sound of running water, such as the brook sings all night long to the quiet stars. Sure enough, at the end of the rather small dining-room was a conservatory built out, in which were arranged rocks, from Sandusky, Ohio. They look like moss-covered rocks in some dingy cell, far from city streets. Little pools here and there snuggled into the crevices, in which goldfish glided about. Ferns bordered it, growing irregularly at different heights. Ivy and a variety of wandering jew ran along the lower edge. This rustic rockery was simply constructed by pipes and galvanized tanks, with an exhaust pipe conducting the water from the lower level out of doors. The room is always kept moist, plants flourish in such an atmosphere, and all the year round a woodsy nook satisfies one's nature-loving heart.

"A good many people say it is foolish to remodel old houses," said Henry Stockmann, the architect of this remodeled Chicago cottage. "It all depends on your own feelings for old houses, and how you go about it. I enjoy nothing better than taking some ugly-looking old cottage, with good foundations and timber, and creating out of it a thing of beauty. It is really all done, too, quite inexpensively. Why should people who love beauty live in ugliness? Why not have a chance to see water, hear it, have things growing about one? The old house from which this was remodeled was one of those ugly cottages seen everywhere over these flat lands. It was simple enough. I just pulled the lines down, left the walls as they were, took out partitions, straightened other lines, put in a curve here, a sweep there, added a rustic porch, used the original beams of oak; here you have it. It is delightful work, sitting down and drawing out the picture you see in place of what looks so ugly. There is such freedom about reconstructing an old house. No one pays any attention to it. If you spoil it, no one feels that you have done any particular damage, yet there is such a satisfaction in working on until you have brought out your ideal.

"It is like working on a block of marble. I remember one cottage which stood on a lot measuring 125x125 feet. I added a large porch to the south, a conservatory and sleeping porch. The ground was perfectly level. We raised the grade to look like a hillside, by putting in a sunken lawn; then we set out all kinds of trees and shrubs. It was most interesting, watching the change from month to month. From an ugly corner, level, the lines of the house severe, we were able to bring out a beautiful estate. The little touches on the house and grounds all make such a difference, yet they are simple and cost little.

"We are slowly getting away from the ideas of a few years ago, and are becoming more individual in our homes. We are going back to the old houses. I am thinking especially of the old Flemish houses, which are being copied so much now, with their inglenooks and other pretty features. It is really not going back, but just taking the best in each period and adapting it to the new.

"There is no excuse for the old stone-front homes. They were only a passing fad. There is no excuse, either, for the style that leaves the roof flat and the chimney off. The home should be built around the chimney, the graceful curves of the roof emphasized. The entrance should be on one side, somewhat concealed. Thus a home is more cosy. Then more care should be given to having the lines of doors and moldings in line with each other. There should never be a break. It destroys the harmony and simplicity of the lines. The secret of all beauty is simplicity. I feel that we are getting back to it in homemaking."

* * *

Misuse of the Word Engineer*

IT is indeed unfortunate that in America most people associate the word "engineer" with a man in greasy overalls who runs an engine or a boiler. The man who operates the boilers of an apartment building is called an engineer, although, as we shall see in a moment, the name is entirely a misnomer when applied to him. He may be a good mechanic, but he is not an engineer. The gray-haired man who drives the locomotive of a transcontinental limited, and who holds the lives of hundreds of human beings in his care, belongs to the very highest type of mechanic; but he is not an engineer—except in the United States and Canada.

Much has been said and written on the importance of educating the public to the true meaning of the word "engineer." In this case, as in many others, it is of far greater importance that engineers themselves be educated to the true meaning. So long as engineers use the word improperly, how can they expect to educate the public to the true usage? So long as engineering magazines and text-books use the word improperly, how can we expect engineers to become entirely clear in its use? It seems obvious that the place to begin is not with the public, but with engineering literature—at the other end of the line.

Now let us investigate the words commonly used in other countries and other languages to designate the man who runs an engine and the man who is a civil engineer (using the latter in the broad sense). To begin with, other languages do not contain a word directly equivalent to the English word "engine." The word commonly used is analogous to the English word "machine" and the different types of engines are designated by proper modifiers. Thus, in French and German, respectively, a steam-engine is a "machine a vapeur" and a "dampf-maschine." In consequence, the man who runs a stationary engine is designated by a word analogous to the English word "mechanic" or "mechanician." Other languages contain a word similar to the word "locomotive" to designate that particular type of engine. The word used to designate the man who runs a locomotvie might, in most cases, be translated into English as "locomotive conductor."

The following table shows, in columns 2, 3 and 4, the words commonly used in various languages to designate the men who in this country are known as civil engineers, locomotive engineers and stationary engineers, respectively:

---

* From an article by Capt. N. M. Stineman, Engineer, Officers' Reserve Corps, in the October Bulletin of the Affiliated Engineering Societies of Minnesota.

	Civil Engineer.	Locomotive Engineer.	Stationary Engineer.
French	Ingénieur	Conducteur de machine	Mécanicien
Spanish	Ingeniero	Conductor de locomotora	Maquinista
Italian	Ingegnere	Conduttore di locomotiva	Macchinista
German	Ingenieur	Lokomotivführer	Maschinist
Swedish	Ingeniör	Lokomotivförare	Maskinist
Danish	Ingeniör	Lokomotivförer	Maskinist
English (England)	Engineer	Engine driver	Engineman
English (U. S. and Canada)	Engineer	Engineer	Engineer

From this table it is evident that in countries other than the United States and Canada there can be no misunderstanding as to the meaning of the word "engineer." Only in the English-speaking portion of North America is its use in a state of confusion. We have succeeded partially, though not entirely, in acquiring the habit of using the correct words in connection with the driving and care of automobiles. Why not correct ourselves in other respects? Nothing could be more logical than the forms used in England, where the civil engineer is known by his true name, the man who runs a locomotive is known as an "engine driver" and the man who runs or takes care of a stationary engine is known as an "engineman."

* * *

Grocery Store Architecture

A CORRESPONDENT of the Improvement Bulletin has, perhaps, in the following article, hit upon something that architects should give serious consideration to. An enterprising citizen of a certain Minnesota town has just bought a bank building and announces that he will remodel it into a grocery.

From which naturally arises the question: "Why remodel it?" If the bank is of the solid, substantial type, sometimes designated as "monumental," a type that signifies financial strength, that defies the burglar and impresses the beholder with a sense of impregnability, it should be eminently suitable for the conduct of a grocery business. There are, perhaps, two vaults—one in which the flour and other similar valuables might be preserved, and the other containing safe deposit boxes, which might be appropriately devoted to the safeguarding of sugar, canned vegetables, potatoes, onions and other eatables whose prices have been soaring skyward.

Why not keep the bank fixtures intact? The mahogany desks of the president, vice-president and cashier of the bank might be used to advantage by the similar officers of the grocery company. Why should the patron not be required to make his wants known, through the bronze grill of the teller's window, to the courteous clerk who, sitting in his cage, with a few parsnips, onions, etc., at his side, is prepared to grant the requests of all who have established their financial responsibility?

Away back in the idyllic days, the grocery was a sort of a community affair. Its wares were displayed to the vulgar gaze on benches in front of the glaring show windows—protected by glass cases only when the health department insisted. The building was of rude construction, with no architectural pretensions, a conglomeration of shelves and counters, boxes and barrels. There was none of the effect of security and impregnability that marked the appearance of a bank. While we all admire notable examples of bank architecture, we do most earnestly hope that the act of the gentleman in the Minnesota town is but a sporadic instance and that he is not setting a precedent in grocery construction.

THE
Architect and Engineer
OF CALIFORNIA

Founded in 1905 by E. M. C. WHITNEY

A. I. WHITNEY - - - *Manager*
T. C. KIERULFF - - - *Legal Points*
FREDERICK W. JONES - - *Editor*

Published Monthly in the interests of the Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast by the Architect and Engineer.

BUSINESS OFFICE AND EDITORIAL ROOMS
627-629 Foxcroft Building, San Francisco
Telephone Douglas 1828

The publishers disclaim any responsibility for statements made in the advertisements of this magazine

TERMS OF SUBSCRIPTION

(Including postage) to all parts of the United States $1.50 per annum; to Canada 50c additional; to all Foreign points $1 additional.

VOL. LI. NOVEMBER, 1917 No. 2.

ASSOCIATE EDITORS

WM. B. GESTER, - *Inspection and Tests*
O. P. SHELLEY, C. E. } *Fireproof Construction*
F. W. FITZPATRICK, }
W. W. BREITE, C. E. - *Structural Steel*
ATHOL MCBEAN } *Brick, Tile and Terra*
HOWARD FROST. } *Cotta*
H. M. LOWENTHAL - *Roofs and Roofing*
FRED'K N. WOODS, JR., - *Rock and Gravel*
WILBUR DAVID COOK, *Landscape Architecture*
PAUL C. BUTTE - *Electrical Construction*
LOUIS G. MAUER - - *Waterproofing*
CHAS. H. CHENEY - } *City Planning and Book Reviews*
W. H. GEORGE - - *Reinforced Concrete*
T. R. BURKE - - *Sanitary Engineering*
J. W. FRICKE.. .. .. .. *School Equipment*

ARCHITECTURAL

Alfred F. Rosenheim — Edward M. Garden
Fred H. Meyer — Irving F. Morrow
August G. Headman — F. D. Hudson
Horace G. Simpson — Elmer Grey
G. Albert Lansburgh — Sumner P. Hunt
Herman Barth — Ernest Coxhead
Chas. S. Kaiser — Harrison Albright
Chas. Peter Weeks — John Parkinson
Octavius Morgan — A. W. Smith
J. C. Austin — William H. Weeks
Edwin J. Symmes — Chas. W. Dickey
W. H. Ratcliff Jr. — Jas. W. Plachek
E. C. Hemmings — Carl Werner

CONTRIBUTORS

Kenneth MacDonald, Jr. — Nathaniel Blaisdell
Wm. L. Woollett — Willis Polk
Wm. Arthur Newman — Smith O'Brien
Wm. C. Hayes — C. H. White
John Bakewell, Jr. — B. J. S. Cahill
Clarence R. Ward — T. Paterson Ross
John Galen Howard — Alfred Kuhn
Louis C. Mullgardt — John Reid, Jr.
W. Garden Mitchell — Arthur Brown, Jr.
Harry E. Squier, C. E. — H. J. Brunnier, C. E.
C. H. Snyder, C. E.

THERE MUST BE MORE BUSINESS THAN USUAL

Howard E. Coffin, of the Advisory Commission of the Council of National Defense, says: "No radical new condition confronts us. State activities, road building, public works, private industries, all must go on as before. Business must be increased, labor employed and the country kept going strongly ahead as a successfully economic machine. We must have successful industries if successful tax levies are to be raised."

There should be no curtailment in building and road construction. Let both public and private useful construction proceed. Production and handling of building materials and public and private construction work are fundamental industries of the country. Any tendency to suspend or postpone building projects is inconsistent with maintaining our prosperity. The country is prosperous. Building investors should not hesitate to go ahead with their plans. Railroads should spare no effort to supply the building industry with the cars needed to transport materials. Government, state, county, and municipal authorities should encourage the continuance of all kinds of building. Road and street improvements in particular should go on unabated, and the government should lift the embargo on freight cars where the latter are required to haul material for urgent road work. Bad roads and streets are factors of first importance in the present high cost of foodstuffs. Never before was the improvement of highways so essential.

Keep on building!

INSURANCE FOR OUR SOLDIERS

Some years ago we strongly advocated, in spite of banking and other opposition, Postal Savings and, if we do say it, played some small part in finally securing the necessary legislation. Postal Savings has proven mighty effective.

Soon after that, and in the face of similar opposition, we advocated Gov-

ernment Employment Agencies, something that had not been thought of before and that was opposed largely on the ground of its being "paternalistic" and competing with private business! We have Government Agencies today and they too are splendidly effective.

We contend that anything that a Government by the People does for the People is right, and this war is proving it. If the Government can, during war, control our railroads, control our food and work it all out to our benefit, why is not such benevolent socialism just as desirable and effective during peace? That's a question we'll be asking ourselves by and by.

But that's an aside. What we were talking about was what the Government was now doing along certain lines first agitated in these pages several years ago.

Coincident with Postal Savings and Government Employment Agencies, we advocated Postal Insurance, (all three projects were ably expounded by their advocate, Mr. F. W. Fitzpatrick, formerly of Washington, now of Omaha, Neb.), a cheap form of insurance for the poor man, something that the big companies will not do, something worked out at actual cost for the people and guaranteed by the Government. At that time we were assured it couldn't be done. Today there is talk of such insurance for our troops, our workingmen in munitions, our farmers. The soldier boys, upon whom we place so much dependence, deserve well by the Government, and we earnestly hope that Postal Insurance, as a corollary to Postal Savings, be given to the country and at once.

WHY DO CONTRACTORS FAIL?

Are contractors good business men? Their success in their chosen field proves that they are, yet the statement has been repeatedly made that contractors' profits are growing more and more uncertain, and that their average credit rating is surprisingly low. Comparatively few fortunes, even moderate ones, have been made in the contracting business.

Why do so many contractors fail? Is it because they do not adopt business methods that are scientifically correct —that stand the acid test of close analysis? Is it because there is too much guesswork in their business—because they do not check their figures sufficiently—because they forget some costly essential when they figure a job? Undoubtedly that is true in many cases. Uncounted contracting firms have become insolvent because of lax methods. They figured by rule-of-thumb, and their bids were made on a hit-or-miss basis. If they erred on the side of an excessively high figure, they did not get the job; there were no receipts to pay overhead expenses and maintain the organization. If, on the other hand, they omitted one or two items in their figures, they "landed" the job at so low a figure that to carry out the terms of the contract meant a loss.

Much expense may be saved and the danger of mistake may be greatly reduced if the quantities of materials are "taken off" on each job, either at the expense of the owner or by an organization of contractors before the job is figured. A good many contractors have been thinking along those lines in the past year or two.

BUILD NOW

Here are a few reasons why the cost of building will not come down for a long time, and why owners should build now: As long as the war lasts just that long will high prices rule. After the war the foreign governments and countries will need all, or at least a considerable portion, of our materials to rebuild their ruins. At the present time our big lumber companies have orders for millions of feet of lumber to be delivered after the war to the foreign governments. This alone will keep the price of lumber at high-water mark. Steel will not drop below $100 a ton, as thousands of ships must be built to replace those destroyed.

The reason there is not more building at the present time is that competition has been entirely too keen the

last few years, and contractors are becoming discouraged. They have reached the point where they refuse to figure a job unless there is something in it for them, and we don't blame them. Those following the building line are human like the rest of us, and are entitled to a living. For some time there has been practically no building of residences, with apartment and hotel construction almost as scarce. Residence work will be plentiful again, however, as soon as one grows accustomed to the high prices, as we must, and will, have more new homes. We cannot stop our desires for the modern conveniences of the present day which are to be found in a "home of one's own."

Los Angeles Chapter Committees

Chapter Membership—S. Tilden Norton, chairman; P. H. Frohman, Lyman Farwell.

Entertainment—P. A. Eisen, chairman; A. R. Walker, A. M. Edelman.

Sub-Committee on Public Information—J. E. Allison, chairman; Walter E. Erkes, F. Pierpont Davis.

Sub-Committee on Competitions—F. Pierpont Davis, chairman; Lester H. Hibbard, Reginald D. Johnson.

Permanent Committee on Legislation—G. E. Bergstrom, chairman; J. E. Allison, H. M. Patterson.

Ethics and Practice—A. C. Martin, chairman; H. M. Patterson, Frank L. Stuff.

Sub-Committee on Education—Elmer Grey, chairman; Carleton M. Winslow, D. C. Allison.

City Planning—H. F. Withey, chairman; Sumner Hunt, Lyman Farwell.

Contracts and Specifications—John P. Krempel, chairman; Frank D. Hudson, A. M. Edelman.

Institute Membership—A. F. Rosenheim, chairman; A. C. Martin, S. B. Marston.

Committee on Building Companies—Robert Orr, chairman; Alfred W. Rea, Homer Glidden.

American Institute of Architects

(ORGANIZED 1857)

OFFICERS FOR 1916-17

PRESIDENT....JOHN LAWRENCE MAURAN, St. Louis
FIRST VICE-PRESIDENT.....C. GRANT LA FARGE, New York
SECOND VICE-PRESIDENT....W. R. B. WILLCOX, Seattle, Wash.
SECRETARY....W. STANLEY PARKER, Boston, Mass.
TREASURER.....D. EVERETT WAID, New York

San Francisco Chapter

PRESIDENT.....JOHN BAKEWELL, JR.
VICE-PRESIDENT.....SYLVAIN SCHNAITTACHER
SECRETARY AND TREASURER.....MORRIS BRUCE
TRUSTEES.....W. B. FAVILLE, G. A. WRIGHT

Southern California Chapter

PRESIDENT.....J. J. BACKUS
VICE-PRESIDENT.....H. M. PATTERSON
SECRETARY.....HENRY F. WITHEY
TREASURER.....AUGUST WACKERBARTH

Board of Directors

LYMAN FARWELL, PERCY A. EISEN, S. B. MARSTON

Portland, Ore., Chapter

PRESIDENT.....JOSEPH JACOBBERGER
VICE-PRESIDENT.....J. A. FOUILHOUX
SECRETARY.....W. C. KNIGHTON
TREASURER.....FOLGER JOHNSON
TRUSTEES.....ION LEWIS, M. H. WHITEHOUSE

Washington State Chapter

PRESIDENT.....CHARLES H. BEBB, Seattle
1ST VICE-PRES....DANIEL R. HUNTINGTON, Seattle
2D VICE-PRESIDENT.....GEORGE GOVE, Tacoma
3D VICE-PRESIDENT.....L. L. RAND, Spokane
SECRETARY.....JOSEPH S. COTE, Seattle
TREASURER.....ELLSWORTH STOREY, Seattle
COUNCIL.....JAMES STEPHEN, Seattle; JAMES H. SCHACK, Seattle; CHARLES H. ALDEN, Seattle

California State Board of Architecture

NORTHERN DISTRICT.

PRESIDENT.....EDGAR A. MATHEWS
SECRETARY-TREASURER....SYLVAIN SCHNAITTACHER

Members

JOHN BAKEWELL, JR. J. CATHER NEWSOM

SOUTHERN DISTRICT.

PRESIDENT.....JOHN P. KREMPEL
SECRETARY-TREASURER.....FRED H. ROEHRIG
MEMBERS.....OCTAVIUS MORGAN, SUMNER P. HUNT, WM. S. HEBBARD

San Francisco Architectural Club

OFFICERS FOR 1917

PRESIDENT.....CHAS. PETER WEEKS
VICE-PRESIDENT.....A. WILLIAMS
SECRETARY.....JOHN F. BEUTTLER
TREASURER.....WILLIAM HELM

San Francisco Society of Architects

President.....GEORGE W. KELHAM
Vice-President.....JOHN REID, JR.
Secretary-Treasurer.....WARREN CHARLES PERRY
Director (1).....CHARLES PETER WEEKS
Director (2).....ARTHUR BROWN, JR.

Engineers and Architects Association of Los Angeles

PRESIDENT.....A. H. KOEBIG, SR.
FIRST VICE-PRESIDENT.....A. S. BENT
SECOND VICE-PRESIDENT.....IRA J. FRANCIS

Directors

J. J. BACKUS, GEO. P. ROBINSON, ALBERT C. MARTIN, H. L. SMITH

Washington State Society of Architects

PRESIDENT.....A. WARREN GOULD
SECRETARY.....WM. J. JONES
TREASURER.....J. L. MCCAULEY
TRUSTEES.....HARRY H. JAMES, WM. J. JONES, ALFRED BREITUNG, J. L. MCCAULEY, G. F. ROWE

San Diego Architectural Association

PRESIDENT.....CHARLES CRESSEY
VICE-PRESIDENT.....W. TEMPLETON JOHNSON
SECRETARY.....ROBT. HALLEY, JR.
TREASURER.....G. A. HAUSSEN

San Joaquin Valley Ass'n of Architects

PRESIDENT.....W. J. WRIGHT
VICE-PRESIDENT.....E. B. BROWN
SECRETARY-TREASURER.....FRANK V. MAYO

With the Architects

Building Reports and Personal Mention of Interest to the Profession

Personal

Gertrude E. Comfort, architect, announces the establishment of offices for the practice of her profession in the Clunie building, 519 California street, San Francisco.

Mr. J. L. McCauley, architect of Seattle, returned recently from a business trip through the East, making a study of hotel construction.

Mr. J. L. Slater, architect, who has been practicing architecture at Walla Walla, Washington, for a number of years, has indicated his intention of closing his offices and locating at some other point.

Mr. George Gove, of the architectural firm of Heath & Gove, National Realty building, Tacoma, is making a six-weeks trip through the East for the purpose of studying office building design.

Mr. L. E. Geary, prominent naval architect, Seattle, has been appointed naval architect of the United States Shipping Board's Seattle district by Captain John F. Blain, head of the district.

Mr. Frank D. Wolfe and Mr. William E. Higgins have formed a partnership for the practice of architecture under the firm name of Wolfe & Higgins, Auzerais building, San Jose.

Mr. E. W. Sankey, former architect of Seattle, leaves for Chili, Valparaiso, on the first passage he can get for that city. Mr. Sankey has had a wide experience as architect and constructor in the Northwest, having maintained offices in Seattle, Yakima and Victoria. He goes to his new home to follow his profession.

Announcement is made of the marriage on October 6th of Miss Esther Bowman, step-daughter of Mr. and Mrs. Harvey Long of Berkeley, and Mr. Chester H. Miller, Oakland architect. The ceremony was performed by the Rev. Raymond Brooks, pastor of the Congregational Church. Mr. and Mrs. Miller will live on Ashby avenue, Berkeley, where they are building a new home.

Mr. Clarence R. Ward, member of the architectural firm of Ward & Blohme, designers of the Machinery Hall and other buildings at the Panama-Pacific Exposition, and many of San Francisco's new fire houses, was married the past month at Santa Cruz, to Miss Evelyn Hammond, sister of Mrs. Waldo Field of the Surf City.

Berkeley Architect Planning Homes for France

Plans for rebuilding the residence portion of some of the devastated towns in France are being made by the National Red Cross, and a Berkeley architect, Mr. Walter H. Ratcliff, Jr., has been employed to design a number of small homes, varying in cost from $2,000 to $3,500, and containing from four to six rooms. The work of raising funds for this benevolent enterprise has already commenced and is meeting with much encouragement.

Oakland Club to Have New Home

The Athenian & Nile Club of Oakland has appointed a building committee to devise ways and means for a new club building. Lease of the club's present home expires in 1919. More room is needed. The members have in mind putting up a building that will represent an investment of from $100,000 to $200,000. The idea is to build a five or six-story structure and reserve the upper floors for club use. Some time ago preliminary sketches for a building were made by Mr. Walter D. Reed, the Oakland architect.

Plan String of Five Theatres

In addition to preparing plans for a new theatre at San Jose and one in Fresno, Messrs. Weeks & Day, Phelan building, San Francisco, will prepare plans for three other playhouses, one to be built in San Francisco, one in Oakland and one in Los Angeles. Negotiations are practically closed for a site on Market street, between 5th and 6th streets, San Francisco, for the local theatre. Options have been secured on Oakland sites, but no final selection has been made. The theatres are to range in cost from $100,000 to $250,000 each and will accommodate from 1500 to 3000 persons.

Bank Alterations

Mr. Smith O'Brien, who, with Mr. Frederick H. Meyer, designed the Humboldt Bank building, San Francisco, some years ago, has completed plans for alterations and additions to the banking rooms of that institution. There will be considerable marble and bronze work, mahogany finish and vault work. About $18,000 will be expended on the improvements.

Seattle Chapter Meeting

Washington State Chapter, A. I. A., held a meeting October 4th, the first regular meeting since adjournment for the summer months. A report from Mr. Charles Alden, chairman of the Civic Planning Committee, was of particular interest. Early in the summer the committee called for suggestive sketches from Chapter members for a town site at Cedar Falls. The present town is located within the new Cedar river watershed reserve and has to be moved. The sketches submitted were of great assistance to the committee in working out their solution of the problem. The plan has been approved by the authorities and will be proceeded with shortly. Mr. Carl F. Gould made a report of conditions in the Architectural Department of the University of Washington. This department, of which Mr. Gould is the head, has fallen off considerably in student registration for the coming year. Many of those in the classes last year have entered the service. Mr. W. R. B. Willcox gave a very interesting account of the meeting of the Board of Directors of the Institute held in Cleveland in September, which he attended.

After San Francisco's "Shacks"

Following the death of three firemen in a destructive fire in some old wooden buildings, the San Francisco authorities are making another attempt to get rid of the cheap frame structures within the fire limits which have been a menace to life and property for a number of years. The Board of Public Works has already taken steps to remove some structures which come under ordinances already passed, and a new ordinance has been framed to cover still other cheap wooden buildings. Most of the wooden buildings aimed at were erected as emergency structures immediately after the great fire of 1906 with the understanding that they should be torn down after two years. If the authorities insist on tearing down these dangerous fire traps, there should be quite a little permanent building done during the next twelve months.

Scottish Rite Temple

Mr. Carl Werner, architect of the new Scottish Rite Temple in Fresno, has been instructed to complete the working drawings at once, and construction will proceed this winter, provided the cost can be kept inside of $150,000.

Building for American Lake Camp

Mr. Earl Burtz, Foxcroft building, San Francisco, has made plans for an attractive frame store building to be erected at the soldiers' camp at American Lake for the United Cigar Stores Company.

Designing Loft Building

Mr. Alfred Kuhn, who recently completed a four-story mill construction building for the Catherine Dunne Estate at First and Folsom streets, and which was described at length by Mr. Kuhn in the August number of this magazine, has been commissioned to prepare plans for a second building for the same owners. It will be built on the south side of Folsom street, 90 feet from First, and will have concrete walls and wood beams and floors. The cost is estimated at $50,000. The building has been leased by a San Francisco printing firm.

Large Manufacturing Plant

Mr. Chester H. Miller, who has offices in the First Trust building, Oakland, has been commissioned to prepare plans for a group of factory buildings for the Oliver Manufacturing Company, formerly the Doak Gas Engine Company, at Fourth and Madison streets, Oakland.

Eventually there will be ten or more buildings, covering an entire block and entailing an outlay of over $200,000. Two buildings will be erected at once—one an assembly shop, 46x300 feet, and the other a machine shop, 46x150 feet. Construction will be of steel and wood.

$75,000 Apartment House

Mr. W. G. Hind, Maskey building, San Francisco, is preparing plans for another large apartment house for Mr. Clyde S. Payne. This will make nine apartments built and operated by Mr. Payne, who states that on November 1st every apartment but one in all eight buildings was rented. Mr. Payne's latest building will be erected on Leavenworth street, between Eddy and Ellis, and will cost $75,000. There will be 55 two-room apartments.

John Bakewell New Chapter President

At the annual meeting of San Francisco Chapter, A. I. A., the past month, Mr. John Bakewell, Jr., member of the firm of Bakewell & Brown, and one of the most popular members of the profession in San Francisco, was elected president, defeating Mr. Edgar Mathews by one vote. The other officers of the chapter are all hold-overs, being re-elected with little opposition.

Architects at the Front

Corporal Eugene K. Martin of the United States Signal Corps, former architect in Berkeley, is now stationed at Fort Winfield Scott, but expects to be transferred to another camp shortly.

Mr. William I. Garren, of the architectural firm of Morrow & Garren, has enlisted in the Officers' Reserve Corps and is now at the training camp at American Lake.

It Costs 36 Per Cent More to Build Today Than in 1915

The following figures give a fairly accurate estimate of the increase, amounting to about 36 per cent, in the cost of labor and materials for building a $50,000 Class C apartment house today over the cost two years ago:

Excavation (teams cost more on account of increase in labor and feed for horses), increase	10 per cent
Concrete	10 per cent
Common brick work, formerly $18 per M, now	$22.00
Lumber—averaged $25	37.00
Millwork increase	12 per cent
Labor—Laborers $2.50 per day, now	$3.50
Carpenters $5.00	5.50
Plasterers $7.00	7.50
Brickworkers $7.00	7.50
Painters $5.00	5.50
Hardware, increase	100 per cent
Glass	33 per cent
Plastering	15 per cent
Sheet metal	20 per cent
Plumbing, formerly $40 per fixture, now $80.00	100 per cent
Heating	100 per cent
Painting	20 per cent
Marble—American	10 per cent
Imported	160-200 per cent
Elevators	50 per cent
Tile work	10 per cent
Roofing $4.50 per day, now $5.00	11 per cent
Steel $70.00 per ton, now $140	100 per cent
Sidewalk lights $1.00, now $2.75	175 per cent

$50,000 Concrete Bridge

City Engineer Hunt of San Jose is preparing plans for a reinforced concrete bridge to replace the antiquated steel and wooden structure over the Coyote river on East Santa Clara street, which collapsed recently under a heavy strain of three freight cars loaded with dried prunes. The new bridge will have a 150-foot span and will cost in the neighborhood of $50,000. Bids will be advertised shortly.

California Redwood

The California Redwood Association has published a very unusual redwood finishing book which shows photographs of the interior of several elaborate homes finished in redwood, in different parts of the country, with colored plates showing the different types of finish and giving formulae for producing the same. The book is designed for distribution among architects, contractors and retailers.

Church and Parish House

Mr. James W. Plachek has completed plans for a frame and rustic church and parish house for the Young People's Alliance Memorial Church, which will be built at 61st street and Channing Way, Oakland, at an approximate cost of $10,000.

Alterations to Gunst Building

Mr. G. A. Lansburgh, Third and Mission streets, San Francisco, is preparing plans for some alterations to the ground floor and basement of the Elkan Gunst building at Geary and Powell streets, San Francisco.

Tire Company Leases Warehouse

The two-story brick warehouse and factory building, construction of which was started last month by Mr. George Wagner, 251 Kearny street, San Francisco, from plans by himself, has been leased to the McGraw Tire & Rubber Co. of East Palestine, Ohio. The owner of the building is the McGilvray Co., whose granite works adjoin the property. Building is to be of brick construction and will cover ground area, 75x275 feet.

Power Plant for Eley

A hydro electric development plant, intended to provide power for the huge copper mines at Eley, Nevada, is being promoted by Mr. Frank B. Ench, 2535 10th avenue, Oakland. The company expects to invest $1,200,000 in the enterprise, which has been submitted to Commissioner of Corporations H. L. Carnahan, for his approval. The plant is intended to develop a total of 10,000 horsepower.

Hollow Tile Residence

Mr. Myron Hunt, 1017 Hibernian building, Los Angeles, has prepared plans for a two-story and basement hollow tile residence to be erected at Douglas, Arizona, for Mr. Grant H. Dowell, general manager for the Phelps-Dodge Company. It will contain twelve rooms and four bathrooms. The cost is estimated at about $25,000.

Store and Theatre Building

Mr. O. P. Dennis, 619 Fay building, Los Angeles, is preparing plans for a one-story store and theatre building to be erected in a suburban city. It will contain two store rooms, lobby, and theatre auditorium to seat 900 people. It will be of masonry construction.

Demand for Draftsmen

There is a demand for draftsmen in many Detroit factories, caused by the enlistment of draftsmen in government work. The companies are seeking draftsmen who are not liable to be called by the War Department

Polytechnic School Addition

Mr. Myron Hunt, 1017 Hibernian building, Los Angeles, is preparing revised plans for a new gymnasium and a general dining hall and kitchen building to be erected at the Pasadena Polytechnic School.

Where Does Roof of Building Begin and End?

From the Red Bluff Democrat.

The courts are going to be called upon some of these days to decide where the roof of a building ends and the dome begins; whether a painter who takes a contract to paint the roof of a school building should also paint the belfry, and whether the inside of a belfry is or is not a part of the walls of the building.

The problem is an important one. It is as important as the old-time discussion as to whether the nose was made for glasses or glasses made for the nose. A Chico contractor had the contract to paint the roof of the Lincoln street school building in this city. Another painter was to paint the walls. The Chico man painted the roof of the building and departed. There is a dome on the building and it has a roof on it. But the Chico man did not paint the roof of the dome. He ruled that it was not properly a part of the roof of the building and that his contract did not call for the dome. The man who was to paint the walls ruled that the dome was not walls and he did not paint it.

And so we are facing the problem as to whether or not a roof is a covering. If a roof is a covering and the roof is taken off the dome of the school building the building would leak. It would appear then that the roof on the dome is essential to keep the kiddies in the building dry. But the Chico painter declares that the roof on the dome is not a part of the roof of the building, leak or no leak. And local painters bear him out. But the fact remains that an unpainted dome sticking through a newly painted roof looks so shabby that the courts ought to rule on the matter in a hurry.

Mr. G. A. Applegarth Busy

Mr. G. A. Applegarth, Claus Spreckels building, San Francisco, has one of the busiest architectural offices in San Francisco just now. Mr. Applegarth is preparing plans for a five-story reinforced concrete commercial building to be erected on Spear street for Messrs. A. B. and J. D. Spreckels, and which probably will cost in excess of $100,000. Plans have been completed for a five-story bank and office building for the Home Savings Bank at Eureka, and for extensive alterations to the old brick stables on Lyon street, San Francisco, owned by the Spreckels interests. The stables will be converted into a modern commercial garage, with new stucco front, cement floors and steel roof trusses.

$20,000 Municipal Building

Mr. John W. Woollett of Berkeley has been commissioned to prepare plans of a $20,000 municipal building for the city of Grass Valley.

OFFICIAL STATE ADVERTISEMENT

Competition Announcement

The Board of Control of the State of California announces to all Architects who are citizens of the United States:

That a Competition has been instituted for the selection of an Architect to design and supervise the construction of State Buildings to be located in the city of Sacramento, California, for the construction, equipment and furnishing of which the people of the State of California have voted $3,000,000.00 in bonds, the site having been donated by the city of Sacramento.

Under the law, the State Architect shall act as architectural advisor in connection with the Competition.

This Competition will be conducted in two stages.

The first stage is open to all Architects, citizens of the United States, who have had the necessary experience, subject to the conditions prescribed in the Programme of the Competition.

The second stage will be open to eight Architects selected by the Jury from those competing in the first stage.

No Competitor shall receive any remuneration unless chosen by the Jury and submitting drawings in the second stage.

The Programme for this Competition is approved by the San Francisco Sub-Committee on Competitions of the American Institute of Architects.

Architects desiring to compete must file with George B. McDougall, State Architect, Forum Building, Sacramento, California, a written request for a copy of the Programme. On December 15, 1917, copies will be mailed simultaneously to all Architects from whom written requests for same have been received. Copies will be mailed to Architects making written requests for same after December 15, 1917, at the time of the receipt of such later requests.

(Signed) BOARD OF CONTROL OF THE STATE OF CALIFORNIA.
Marshall De Motte, Chairman;
Clyde L. Seavey,
Edward A. Dickson,
Members of Board of Control.
P. J. Tehaney, Secretary.

Dated: November 1, 1917.

Southern California Power Plants

The Southern California Edison Company of Los Angeles is completing arrangements for building two large power plants at Big Creek, the improvements to entail an expenditure of $2,000,000. Preliminary work is already under way.

The Contractor

HIS TRIALS, TRIBULATIONS AND TRIUMPHS

The Fight Against the Secret Contract

THE departure of Congress appears to give hope and create expectancy in those quarters where there has been much activity of late, toward increasing the degree of secrecy that shall be applied to contracts made for war material. The comments of representatives and senators during the hearings before committees at the Capitol and in the debates on the floor of the House and Senate indicate that there is a fixed congressional sentiment in favor of publicity in most of the transactions involving the expenditure of public funds under contract. So long as Congress was in session there has been a menace to all plans for the suppression of contract information. Congress was at any time liable to insert a clause in one of the pending measures, restricting the civilian bodies that have had so much to do, directly or indirectly, with the purchase of military-naval supplies. Now that Congress has adjourned until the first week in December, there is opportunity to do pretty much as the opponents of publicity may desire without, at least present, congressional check.

The sentiment of the business world is decidedly in favor of having all contract negotiations of the Government conducted without concealment. A sample of the numerous communications which have reached this office, prompted by recent editorial comment in these columns, is that from a well-known New York firm, from whose letter we extract the following passage:

> The writer personally thinks that the Government officials are taking long chances in treating bids secretly. No one can be absolutely proficient in the whole line of articles being purchased. Too frequently do the officials permit their selections to be guided by the price, rather than the quality and efficiency of the product offered. A check upon this would be the presence at the opening of bids of competing bidders. If a bid were lower than the proper quality could possibly be produced for, the individual offering an acceptable product at a reasonable price would naturally insist upon investigation and lead to exposure of any attempt at fraudulent transactions. We feel that the department is making a great mistake and rendering itself open to severe criticism later on. It would be well to profit now by the experience of those who had charge of contract matters during the Spanish-American war.

One of the gravest mistakes that can be made is to surround the business transactions of this Government with rules that deny to bidders and to the commercial world generally full information. There is no "military necessity" for secrecy and nothing is derived from such a policy contributing to the economy of the present war situation, or to the security of national defense or to the embarrassment of the enemy.

There are, indeed, some striking instances of what secrecy can do in the way of increasing price; just as there are examples of the extravagance incurred by refusing to deal with sales agents and so-called "middlemen." In the same way, there is a disadvantage in shutting out the sub-contractor, who is deprived of his market by not being able to ascertain the contractors with whom he could deal with profit to contractor and Government.

There is a delightful inconsistency in the policy of the War Department, it is worth remarking, when the Secretary of War is found giving out a statement in considerable detail concerning the intentions of the Government in the matter of aircraft, of obvious interest to the enemy, while there is at the same time refusal to impart the much less sensational information as to the contracts for equipment.—U. S. Government Advertiser.

Architects Close Offices

Mr. W. G. Hind, architect in the Maskey building, has given up his offices there and will take a needed rest. Until further notice Mr. Hind may be reached at his home, 2019 Channing way, Berkeley.

Mr. Houghton Sawyer, architect, has closed his office in the Shreve building, San Francisco.

You Just Can't Suit Some People

"You just can't suit some people."

"For instance?"

"Fellow had his house picked up by a cyclone and landed over in another county without being damaged."

"And yet?"

"And yet he was sore because it didn't land over a cellar-hole."—Building Age.

Shuts Down Gravel Plant

The Grant Gravel Company has closed its plant until further notice, due, it is said, to the Government embargo on flat freight cars.

BROOKS & DOERR

SOLE MANUFACTURERS OF

IMPERIAL WATERPROOFING

ANNOUNCE

REED BAXTER

3419 BROADWAY

OAKLAND CALIF.

AS THEIR SOLE DISTRIBUTOR OF

IMPERIAL WATERPROOFING

MR. BAXTER SUCCEEDS THE IMPERIAL COMPANY OF SAN FRANCISCO, CALIF., WHO HAVE HAD THE DISTRIBUTION OF IMPERIAL WATERPROOFING PRIOR TO SEPTEMBER 1917

FOR THE PROTECTION OF THE USERS OF IMPERIAL WATERPROOFING WE HAVE HAD COPYRIGHTED THE TRADE MARK

WHICH WILL BE PLACED ON ALL CONTAINERS OF THE GENUINE IMPERIAL WATERPROOFING

LOOK FOR

THE LABEL

The Building Situation

SAN FRANCISCO is not the only large city in the United States that is suffering from depressed building conditions. In fact, from all accounts, conditions in the East are a lot worse than here in California.

Writing of the depression in New York and vicinity the American Contractor attributes existing conditions to three causes—the high cost of materials, the difficulty of getting and of keeping an adequate supply of skilled labor and the growing uncertainty regarding deliveries in certain indispensable commodities, such as structural steel. Other factors enter into the situation, such as the indisposition of the banks and insurance companies to finance operative and investment building on a large scale in face of the uncertainty of the future; the high money rate existent in certain sections of the country; the natural timidity of the investor about putting his money into tangible property at a time when the government is seeking new and drastic levies on incomes and the feeling everywhere prevalent that the war will not last and that with its termination material costs will drop to nearly normal.

* * *

According to Stone, a very important conference of the building interests of New York was held in the office of Borough President Marks a few days ago. The meeting was the largest of its kind that has been held in the city for many years. Over two hundred builders and material manufacturers, bankers, officers of large loaning institutions, real estate men and labor representatives were present, crowding the office so that standing room was at a premium. The conference was called by President Marks at the request of the Building Materials Exchange for an interchange of views on the present building situation.

The purpose was to devise ways and means of inducing building in the metropolitan district, which since the war has been very inactive. So little construction has taken place here, the writer in Stone goes on to say, that the situation is serious. The shortage of apartments and business space has forced rentals to undue levels. Many New Yorkers have been forced to find living accommodations outside of the city because of the rentals, and others have been forced into the suburbs because of the lack of apartment space here.

A resolution to ask Congress to appoint a Commissioner of Peace Industries to regulate prices, if necessary, so that the business of peaceful industries might be continued during the war on a reasonably normal basis, was unanimously adopted.

President Marks in his address gave figures for the last four years showing the tremendous falling off in buildings. In 1914, plans were filed for buildings during the first eight months valued at $34,491,240; in 1915, $50,996,300; in 1916, $100,987,645, and in the present year, $23,852,925. Many of the plans filed in 1916 and 1917 were in anticipation of the zoning law restrictions. About 40 per cent of the new buildings now in course of construction were planned in 1916. But of the $23,852,925 worth of new construction planned this year less than $500,000 worth of the work has been completed to date.

* * *

In Philadelphia the Builders' Guide reports that the building material market as a whole is rapidly settling down to a realization that an important part of the responsibility for improving building conditions rests with the manufacturers and dealers in materials and supplies. There is a growing tendency among these interests to assist matters wherever possible by a close co-operation, through which the general welfare of the industry will be augmented. Although as a class building materials have not been substantially lowered in price, there is a feeling of additional stability to the market that has brought with it a more optimistic attitude on the part of the majority of interests.

* * *

For a long while the building industry as a unit has placed a large part of the responsibility for the recent marked recession of structural activity upon the steel interests. The high prices of fabricated steel were undoubtedly an important factor in halting construction work, particularly that type of building dependent upon structural steel in any great quantity. Now that both production and price of steel have been brought under control by the proclamation of President Wilson the building industry does not seem to be much better off than it was prior to the announcement. Before conditions radically improve the entire building situation must undergo a complete readjustment to the new conditions that have been imposed upon it by governmental action. It is generally thought that this will require a considerable length of time. Certainly results could not be expected to immediately follow the price fixing announcement. A condition that was the outgrowth of a long list of depressing factors could not possibly be relieved by a spoken word or a signature upon a document, but will require a period of time in proportion to the value of the anticipated relief.

The labor situation is disquieting in all parts of the country, and but for the good crop yield, which gives promise that food-stuffs will not generally go above present levels, it would be alarming. It is not surprising that with high prices prevalent on all sides wage-earners should claim more pay, but the disquieting thing is that higher wages mean still higher prices, and thus we travel in a circle, comments the market review of the National City Bank of New York City. At last the explanation is that the country is trying to do more work than there is labor to do it with. A vast amount of work is being done under rush conditions for the government, and the contractors have offered wages that would bring labor out of the regular industries. Sixteen cantonments have been built in different parts of the country at a cost of $150,000,000, in three months, and about 8,000 to 10,000 workmen have been employed on each. The influence of this upon the labor situation has been widespread. Numerous shipyards are under construction, steel works and munition plants are crowded with orders and hundreds of new coal mines are struggling to get a share of the labor supply. The point has been reached where it is a serious question whether any further construction work should be done unless directly required by the war emergency.

It Is Captain Capron Now

Mr. A. J. Capron, one of the best known building material men and manufacturers' representatives in the Northwest, with offices in Portland, Ore., has enlisted in the Quartermasters Department of the United States Reserve Corps and has been appointed a captain. His headquarters at present are "somewhere in Arizona." Capron has been a frequent contributor to the pages of The Architect and Engineer, one of his most recent articles being on the subject of paints, which was reprinted in many of the Eastern technical magazines.

Heating and Lighting

Warm Air Furnace Heating

By I. F. GRUMBEIN *

RAPID strides forward have been taken in the heating and ventilating of buildings during the last decade. For more than fifty years, warm air furnaces have been installed in buildings for heating them, but we are frank to admit that a large proportion have not been entirely successful, due principally to two causes:—first, improper design and construction of the furnace; and, second, improper installation of the furnace and the piping. Perhaps the part failure of these jobs was due to a contributory cause, in the lack of proper judgment used in the selection of the type of furnace to be installed.

In the selection of the type of furnace, due consideration must be given to height and size of chimney, depth of basement or cellar in which the furnace is to be placed and the size and quality of fuel to be used. Some types of direct-draft furnaces are admirably adapted for bituminous coal while this same type could not be economically used with large anthracite coal. The indirect type only should be selected where anthracite will be used, except where it is the intention to burn pea or smaller size coal, or where the chimney may lack height or size. There are, of course, a large number of instances where a good grade of bituminous coal is successfully used, but this requires frequent cleaning of flues, radiators, smoke pipe and chimney and proper attention to the fire.

By improper design and construction of the furnace, we refer to ill-fitting

*Extracts from a paper presented at the Semi-Annual Meeting of The American Society of Heating and Ventilating Engineers, July, 1917.

Wybro
Reg. U. S. Pat. Office
The Panels that are as good as they are famous.

244 Varieties of
Wybro Quality Panels

If it's a **different kind** of a panel you require, you will find it among the WYBRO family of 244 varieties.

WYBRO PANELS come in all woods and sizes. Each variety is fully as good and worthy of the name.

Whatever "kind" of a panel you need is listed in our Wybro catalogue, which is free to you for the asking.

White Brothers 5th and Brannan Sts. San Francisco

DON'T WAIT — OR LOSE TIME HUNTING
Get the Man You Want Instantly. USE THE

"National Calling System"
THE INSTANT MAN FINDER

WESTERN REPRESENTATIVES:
Sierra Electric Construction Company
619 CALL BUILDING, SAN FRANCISCO Phone Sutter 2297

HIGH GRADE
ELECTRICAL CONSTRUCTION WORK
FOR BUILDINGS

BUTTE ENGINEERING AND ELECTRIC CO., 683-87 Howard Street,
SAN FRANCISCO, CAL.

PACIFIC FIRE EXTINGUISHER CO.
ENGINEERS AND CONTRACTORS

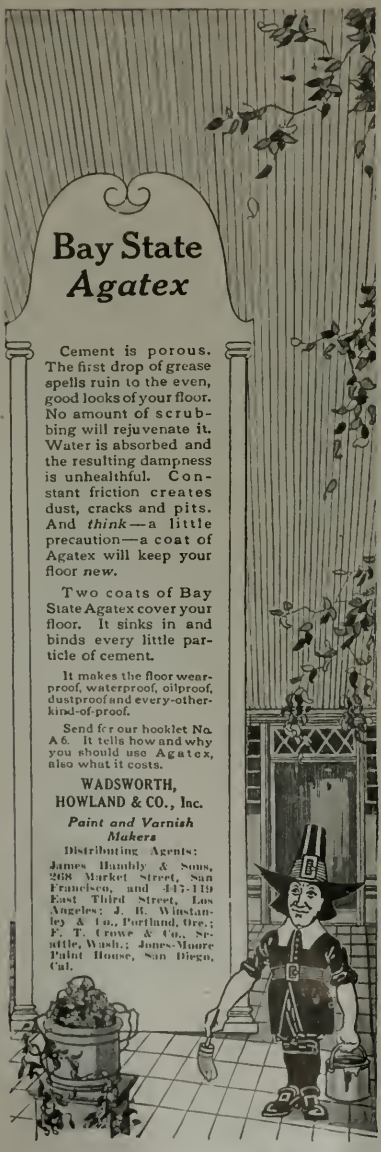
Heating and Ventilating, Electrical Installations, Fire Extinguishing Apparatus

THE GRINNELL AUTOMATIC SPRINKLER
Main Office: 507 MONTGOMERY STREET, SAN FRANCISCO, CAL.

Branch Offices:
217-218 Colman Building - - - - - - - - - Seattle Wash.
504-505 McKay Building - - - - - - - - - Portland, Ore.
826 Paulsen Building - - - - - - - - - - Spokane, Wash.
563 I. W. Hellman Building - - - - - - - Los Angeles, Cal.

Ask the Architect-He Knows

where you can get good and suitable lighting fixtures for your new building. He is interested in having the lighting brighten (not deaden) the effects he has sought to accomplish in his architectural design. He will, doubtless, advise you to go to ROBERTS MFG. COMPANY, 663 Mission Street, San Francisco, where you will find the largest stock to select from, all at equitable prices.


Bay State
Agatex
Cement is porous. The first drop of grease spells ruin to the even, good looks of your floor. No amount of scrubbing will rejuvenate it. Water is absorbed and the resulting dampness is unhealthful. Constant friction creates dust, cracks and pits. And think—a little precaution—a coat of Agatex will keep your floor new.
Two coats of Bay State Agatex cover your floor. It sinks in and binds every little particle of cement.
It makes the floor wearproof, waterproof, oilproof, dustproof and every-other-kind-of-proof.
Send for our booklet No. A 6. It tells how and why you should use Agatex, also what it costs.
WADSWORTH, HOWLAND & CO., Inc.
Paint and Varnish Makers
Distributing Agents:
James Hambly & Sons, 268 Market Street, San Francisco, and 445-449 East Third Street, Los Angeles; J. H. Winslanley & Co., Portland, Ore.; F. T. Crowe & Co., Seattle, Wash.; Jones-Moore Paint House, San Diego, Cal.

parts, poor or light material and material unsuited to the requirements, improper allowance for contraction and expansion, incorrect ratio between grate and radiating surfaces, and the use of steel plate where cast iron would be far better.

Improper installation is by far the greater cause of unsuccessful jobs. Furnaces should be installed so that the greatest possible rise or pitch can be given to the pipes leading to the risers, except very short pipes running to rooms that are favorably located. Risers should be of adequate size to furnish plenty of heat and air at a velocity of 280 ft. per minute for first floor rooms and 400 ft. for second floor rooms, with a slight addition to the size of piping leading to the exposed room or rooms at the greatest distance from the furnace. A fresh air duct from the windward side of building should be connected to the bottom of the furnace casing. The area of this duct should equal the area of all the warm air pipes taken off the furnace case, with a damper for regulation of the fresh air supply.

A great deal has been written on the subject of insulating the furnace casing. We recommend an outer casing of galvanized iron, covered with one thickness of 14 lb. asbestos and an inside casing of black iron with air space between the two casings of about one inch. Our test made in zero weather with this casing and an additional covering of the outer casing of one inch of plastic asbestos showed a gain of less than 4 per cent, which we may consider a negligible quantity.

Following, we will give a rule for ordinary house heating which has proven to be thoroughly reliable:

"To determine the size of furnace required to heat a given building to 70 deg. in zero weather, reduce the exposed wall surface to equivalent glass surface. This is done by finding the square feet contained in all the exposed walls; also the square feet of glass surface. After deducting the glass from the wall surface, divide the remaining wall surface by four, as the loss of heat through glass is four times as great as it is through the ordinary wood and plaster wall.

"Since 1 sq. ft. of glass will transmit about 85 heat units per hour when the difference between the inside and outside temperatures is 70 deg., to find the total loss of heat by transmission, multiply the number of square feet equivalent glass surface by 85. To this must be added the loss of heat by leakage or ventilation.

"If the air enters the room through the registers at 140 deg., which is about the temperature in zero weather, one-

To Be "Low Bidder" Not Always Our Aim.

Our most particular attention is given to prompt and skillful handling of all electrical work of any nature with "QUALITY AND SERVICE GUARANTEED."

Our nation-wide organization and large experience in this field assures you always of fair estimates and absolute satisfaction.

F. E. NEWBERY ELECTRIC CO.

163 Sutter St. (413 Lick Bldg.) San Francisco, Phone Sutter 521

ASBESTOS PROTECTED METAL FOR ROOFING AND SIDING

For permanent industrial buildings of all classes.
Economical — Low maintenance.
Permanent without paint under the most severe conditions of service.

ASBESTOS PROTECTED METAL CO. Ask for Bulletin.

First National Bank Bldg., PITTSBURGH San Francisco Office, Hobart Bldg.

ELECTRICAL CONSTRUCTION CO.

ELECTRICAL CONTRACTORS

604 MISSION STREET SAN FRANCISCO, CAL.

"LENNIG SYSTEM"

ELECTRIC HEATING RADIATOR with Automatic Temperature Control

The THERMOSTAT and THERMOPILE are only sold to Manufacturers and the Trade. Not at retail and not to be installed by this company.

Contractors and Dealers in Plumbing and Heating Goods—Ask for detailed information. Our proposition will interest you.

THERMIC ENGINEERING COMPANY *CLAUS SPRECKELS BUILDING, SAN FRANCISCO*

DESIGNERS OF FIXTURES

GOOLD & JOHNS

ELECTRICAL CONTRACTORS AND ENGINEERS

Phone 1-1-1-1 113 S. California St., STOCKTON, CAL.

San Francisco, Cal. Oakland, Cal. Los Angeles, Cal.

NEPAGE, McKENNY CO.

Electrical Engineers and Contractors

Phone Sutter 2369 149 New Montgomery St., San Francisco, Cal.

H. W. Fincke Geo. C. Derby

IDEAL HEATING & ENGINEERING CO.

FAN SYSTEMS FOR HEATING AND COOLING

General Sheet Metal Work Warm Air Furnaces
Ideal Air Washers Blow Pipe Systems

PHONE MARKET 3708 192 ERIE STREET, SAN FRANCISCO

CITY OF PARIS

Decorative Studios

GEARY AND STOCKTON STS. SAN FRANCISCO

half the heat supplied is carried away by the air escaping at 70 deg. and the other half is lost through walls, windows, etc. Therefore, twice the amount of heat lost by transmission must be supplied by the heater.

"One pound of good anthracite coal will give off about 13,000 B. t. u. Of this amount the best furnaces will safely utilize 70 per cent. In very cold weather a rate of combustion of 4 to 5 lbs. of coal per square foot of grate surface per hour must be maintained. As the furnace has an efficiency of 70 per cent of the fuel, which would be about 9,000 B. t. u. per pound of coal burned, we have 9,000 multiplied by 5 equal 45,000 B. t. u. per hour per square foot of grate surface transmitted to the air passing through the heater. Therefore, the equivalent glass surface multiplied by 85 multiplied by 2 divided by 45,000 will give the size of grate in square feet. When this is reduced to square inches the diameter of the grate can easily be found.

"The main steps involved in calculating the size of warm air pipes for rooms are to determine the loss of heat through walls, windows and floors or ceilings of the room; the volume of warm air required to offset this loss, and the velocity of air in the pipes.

"The loss of heat is calculated by first reducing the total exposure to equivalent glass surface. This is done by adding to the glass surface one-quarter the area of the exposed wood and plaster walls, and one-twentieth the area of the floors or ceilings to cover loss of heat to non-heated basements or attics. Ten per cent is added when the exposure is particularly severe. Having obtained the equivalent glass surface, multiply by 85 (the loss of heat per hour per square foot of glass with 70 deg. difference in temperature); the product will be the total loss of heat by transmission per hour. If the temperature of the entering air is 140 deg. and that of the room is 70 deg., the air escaping at approximately the latter temperature will carry away one-half the heat brought in. The other half, corresponding to the drop in temperature from 140 to 70 deg., is lost by transmission.

"With the outside temperature at zero, each cubic foot of air at 140 deg. brings into the room 2.2 heat units. Since one-half of this can be utilized to offset the loss by transmission, to ascertain the volume of air per hour at 140 deg. required to heat a given room, divide the loss of heat by transmission by 1.1. The quotient is the volume sought. This result divided by 60 gives the number of cubic feet per minute.

"Assuming a velocity of 280 ft. for the first and 400 ft. for the second floor (these velocities are readily obtainable in practice), the area in square feet is determined by dividing the volume by the velocity in feet per minute. This area is reduced to square inches, from which the diameter of the pipe is obtained."

These figures are based on using wooden window frames and sash well fitted with single glazing. Where a first-class quality of metal stripping is used for wood sash, a reduction can be made of 15 per cent; where hollow metal frames and sash are used, we will remain uncomfortable near the windows in zero weather, and when a strong wind is blowing against the window, even if we add 50 per cent of heat to the room.

In a test recently made, we obtained some gratifying results. The grate surface equaled 2.5 sq. ft., a total of 5 lbs. of anthracite chestnut coal with a heat value of 14,100 B. t. u. delivered 60,840 and showed an efficiency of 86 per cent, but when we doubled the rate of combustion, the efficiency was reduced slightly below 80 per cent.

In house heating, it is very seldom that we are enabled to install a fan to force circulation. This has proven to be of great benefit to the installation in more ways than one; namely, it increases the life of the furnace, enhances the comfort of the user and reduces the cost of heating by increasing the efficiency from 6 to 8 per cent in ordinary practice.

Whalen Goes With Sloan Valve Co

The Sloan Valve Co. has secured the services of Mr. E. C. Whalen as their Pacific Coast representative to succeed Mr. T. R. Burke, who goes to the home office as an executive. Mr. Whalen is very well and favorably known among the Coast architects and the trade and his ability insures continued success for the Sloan people with their high-grade Royal Flush Valve.

WALL PAPER ✤ Uhl Bros.
PHONE KEARNY 255 38 O'Farrell Street, San Francisco

Co-operation with Architect and Contractor

By A. C. McMICKEN, Portland, Oregon.*

THE steady increase in the efficiency of incandescent lamps and the constant revision downward of lighting rates is seriously affecting residence earnings and the problem of keeping these earnings up is not solely one of selling current-consuming devices, but includes providing facilities for using them conveniently and safely.

We should be looking ahead, not one year or two years, but ten years, and endeavor to picture conditions in the future. Begin now to prepare for changes which are bound to come at least insofar as they will affect the use of electricity in the home.

During the past ten years the more common lamp socket devices have sprung into being and have become well established, and now the vacuum cleaner, washing machine and electric range and water heater are becoming recognized as practical household necessities. The electric range is not yet universally established and accepted—not because it is not a splendid cooking medium, but because we have not all gotten behind it, and because we have not yet had time to educate our consumers to its many advantages.

The day of the electric range is fast approaching, as also is the day of every other electric household labor saving device. Fuel, whether it be oil, coal, wood or gas may be expected to increase in price as time goes by. This is our opportunity. Are we preparing for it?

In order to arrive at some definite idea for co-operation sets of questions were sent to architects, building contractors, wiring contractors and central stations. From the answers to these questions it is apparent that the architects consider that they are specifying ample circuits for lamp socket devices and the like, but are not yet convinced that circuits for ranges and water heaters are necessary; and it is further apparent that but a small percentage of homes are built under the architect's supervision.

Someone has said, "You can't tell an architect anything." Have you a wide acquaintance among the architects in your territory? Do you know a class of men any quicker to adopt improved methods and practices? Perhaps the reason you do not get full co-operation from architects is due to your method of approach.

Building contractors and home building companies and associations who build homes for sale costing from $4000 up provide a fair amount of convenience circuits and outlets, but need to be educated to greater effort. The vast majority of houses built without architects' supervision, whether for sale or for the owner, do not have sufficient convenience circuits and outlets and in many instances do not have ample lighting circuits and switch control. This is largely due to houses being built for a lump sum, the wiring, as well as other items, is cut down.

Both building and wiring contractors report that they have difficulty in convincing the owner of the desirability of convenience circuits and outlets except for certain appliances such as an iron outlet in the kitchen. In most instances the matter is given little consideration by either the building contractor or the owner.

The contractors suggest that suitable literature setting forth the desirability, convenience and utility of convenience circuits and outlets sent the owner or prospective home builder when plans are being made or at the time building permits are taken out would greatly assist them in having such circuits installed. They suggest that this should be the function of the central station.

It is well to state here that we cannot expect to have the co-operation of the wiring contractors if we are to com-

*Extracts from a paper on "Co-operation in Modern Home and Apartment House Wiring Practice" presented before the Northwest Electric Light and Power Association convention at Spokane.

O'HARA & LIVERMORE
Designers of
INTERIOR DECORATION
IN ALL ITS BRANCHES
- STUDIOS AT -
522 Sutter Street
SAN FRANCISCO, CAL.
Tel. Sutter 284
251 E. Colorado Street
PASADENA, CAL.
Fair Oaks 2175

Master Builders Method

Master Builders Method — with Master Builders Concrete Hardner — is standard practice the world over for the construction of concrete floors that are Dustproof, Wearproof and Waterproof. More than 21,000 satisfied users. Over 80,000,000 sq. ft. in every-day use. Makes the ideal type of floor for all buildings where floor service is essential and the elimination of dust is necessary. Send for our "Primer"—a complete text book on the subject of better concrete floors. Sent FREE, without obligation.

THE MASTER BUILDERS COMPANY

Makers of Master Builders Concrete Hardner; Master Builders Red Concrete Hardner; Master Builders Black Concrete Hardner; Roadyte Concrete Hardner for Concrete Roads; Saniseal Liquid Concrete Hardner.

Main Office and Works: CLEVELAND, OHIO.

AGENTS

Colvin & Hoskins
Spokane, Wash.
Raymond C. Grant
Helena, Mont.
Sam Hunter Co.
Seattle, Wash.
F. S. Cook & Co.
Portland, Ore.
C. Roman Co.
San Francisco, Cal.
A. E. Banks,
Los Angeles, Cal.
S. A. Roberts & Co.
Salt Lake City, Utah

pete with them in their field. Electrical contracting is a legitimate and specialized business, and one in which the central stations should not engage unless the community served is too small to support a local wiring contractor. Some central station managers still consider the contractors fair-weather friends, and make no effort to really get acquainted and find out that the average contractor is a regular fellow after all.

It has been proven that the wiring contractor can be of great assistance in inducing the owner, architect and building contractor to make provision for range and appliance circuits and outlets. In many instances the contractor also sells appliances and is therefore doubly interested in seeing ample convenience circuits and outlets installed.

Houses and apartment houses built for sale or rent will not do, either, unless wired for electricity and the demand for convenience circuits and outlets is increasing. A woman used to electric light and appliances, when house hunting invariably notices whether the switches are conveniently located and whether convenience receptacles are provided. Many already built houses have been wired solely because the occupant wanted to use an iron or other device.

Salesmen for one of the large home building concerns carefully call the attention of prospective buyers to the ample and conveniently located switches provided and also to the baseboard, wall or floor receptacles in every room for the vacuum cleaner, piano lamp, etc. They know it helps to sell the property.

The fact that practically every house and apartment building erected in the last four or five years in the Pacific Northwest was wired at the time for electric light does not mean we need not bring to the attention of the builder and owner the desirability for a better standard of wiring and illumination.

A home or an apartment house is not built to last a year or so, but to last a lifetime. Why not wire it now so that electricity may be conveniently and safely used to operate anything from an iron to an electric range? The owner may not contemplate installing an electric dishwashing machine in the kitchen at present, or a washing machine in the laundry, but he will have both some day and the outlets should be provided while the house is still on paper and the outlets can be added with the least additional expense.

We believe that the larger central stations can well afford to employ an illuminating engineer, who can make

DO YOU USE ANY HIGH GRADE

CABINET or HARDWOODS?

WE MAKE A SPECIALTY OF THEM

PRIMAVERA, MAHOGANY, KOA, JENISERO, OAK, ASH, ETC.

DIECKMANN HARDWOOD CO.

Beach and Taylor Streets, SAN FRANCISCO

ROBERT W. HUNT JNO. J. CONE JAS. C. HALLSTED D. W. MCNAUGHER
ROBERT W. HUNT & CO., ENGINEERS
BUREAU OF INSPECTION TESTS AND CONSULTATION
251 KEARNY ST., SAN FRANCISCO
NEW YORK LONDON CHICAGO PITTSBURGH ST. LOUIS SEATTLE TORONTO MEXICO CITY
CEMENT INSPECTION
INSPECTION OF STRUCTURAL AND REINFORCING STEEL
REPORTS AND ESTIMATES ON PROPERTIES AND PROCESSES
CHEMICAL AND PHYSICAL TESTING LABORATORIES

himself invaluable to the architect, contractor and owner by preparing wiring plans and specifications and making suggestions as to the color of walls, ceilings and draperies best adapted to the lighting effects desired, with due consideration for the type and class of fixtures and glassware to be used.

The illuminating engineer will also instruct and assist the salesman along illuminating engineering lines, which, by the way, is not confined to the proper design and location of lighting installations only, but applies equally as well to making provisions for current consuming devices and motor loads.

After all is said, the man who pays the bills is the man who must be convinced. Co-operate with the architects, the building and wiring contractors, but above all bring your heavy artillery to bear on the home builder and owner. He will spend the money for comforts and conveniences for his loved ones if you can convince him that electricity will lighten their household tasks and make life more enjoyable.

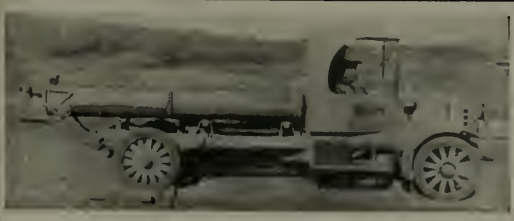
Paint Company Expands

Magner Bros., well-known San Francisco paint makers, have purchased the business of the Jones-Duncan Paint Company, including formulae and brands, and are now prepared to supply the trade with Alvaline, Cementoline and other products formerly manufactured by the Jones-Duncan Company. Magner Bros.' new address is 414-424 Ninth street, San Francisco.

Mail Chute Order

Mr. E. E. Gilmner, in charge of Frederick S. Cook & Co. business in Portland, Ore., has been awarded an order for the installation of mail chutes in the new U. S. postoffice building there from plans by Mr. Lewis P. Hobart, San Francisco architect. The order includes the mail chutes and boxes. The equipment is manufactured by the American Mail Chute Corporation and is its first installation to be made in Portland.

Western Vacuum Supply Co.
CALIFORNIA AGENTS FOR
Palm Vacuum Cleaners
ANY SERVICE
ANY CAPACITY
Plants Noiseless in Operation
Office and Demonstrating Room:
1125 Market St. Telephone Park 4294
Rialto Theatre Building San Francisco



STERLING MOTOR TRUCKS
A complete line in stock for immediate delivery.
EDWARD R. BACON COMPANY, Pacific Coast Agents
51-53 Minna Street, San Francisco Telephone Sutter 1675

The Passing of the Carpet

By W. L. CLAFFEY

A PROMINENT physician in a lecture on sanitation once said if the old-fashioned carpets, which cover the entire floor, were eliminated and oak floors and rugs were used that the health of the family and community would be greatly improved.

The carpet is the champion collector of dust and germs, and that to keep a carpet thoroughly sanitary it would be necessary to wash it or steam it every week or two, and, of course, this is not practical, so the best thing is to get rid of the carpet. Anyone who has been around a spring cleaning and caught a view of the dirt which has sifted through the old-fashioned carpet was certainly appalled at the sight.

The manager of a rug department of a large department store remarked recently that they practically have no demand for the old-fashioned carpets for covering the entire floor. The carpets that they do sell are usually for runners, or are made up into rugs. This can be very easily verified when visiting other people's homes, where you will invariably see oak floors and rugs. A recent survey in Chicago in three square blocks revealed the fact that 95 per cent of the houses or apartment buildings had oak floors and rugs.

Women are responsible for the modern oak floor and rugs. They were quick to recognize that oak floors and a few choice rugs created an artistic appearance and simplified house-cleaning and housekeeping. With the advent of the apartment building, which meant rented apartments, and the unstable tenantry, the old-fashioned carpet had to be cut and fit almost every time the removal period came around. This made great inroads into the expense account. Rugs of any reasonable size will always fit in any house or in apartments.

Nearly everything these days is based upon appearance. When an owner erects a home, the first thought is how the building is going to look from the outside. After this the details of the arrangement of rooms, the flooring, the finish, the furniture, the rugs, and the drapes. All are given especial attention in order to get the proper artistic effect. Some of the department stores in large cities have unique ways of exhibiting furniture, rugs and drapes by actually building a small cottage in their stores and equipping it completely from the kitchen to the living room. Visitors in this way oft-times get very valuable suggestions for their home.

The modern oak floor is the result not only of a long process of evolution, but also distinct changes in the ideas of living. Oak floors are also responsible for the re-arrangement of rooms in the modern home, such as eliminating the parlor, the location of the dining-room in front of the house, the breakfast room, the garage in the cellar, etc. One innovation leads to another, and women get the blame, at least from the architects and builders.

Oak floors today have ceased to be a luxury, due to quantity manufacture; in fact they have become a necessity in every home, from the mansion to the small modest cottage. Oak flooring is peculiarly suitable for homes, as its color is a rich brown and blends perfectly with all kinds of furniture and decoration.

There is many an old house today that remains unrented because the old pine floors look very shabby and uninviting. If the owners of these buildings would lay ⅜-in. oak flooring over these unsightly old floors it would undeniably make a splendid investment. It would attract a better class of tenants or buyers, and would increase the renting or selling values. A floor is the very first thing that you observe when entering a building, and about the last thing that you see when going; in fact it is the most important part of the interior construction. Astute landlords will invariably emphasize oak flooring in the daily papers when they offer their house for rent or for sale. This gives the impression that the house is modern, and that all the other material used is of a high-class standard.

COST OF CARPETS VS. OAK FLOORING

The average home builder and even the contractors are very often misled in regard to prices on oak flooring. Comparative prices clearly indicate that oak flooring is by far the cheaper.

A fair average price for a good body Brussels carpet would be about $2.50 a carpet yard. A carpet yard contains 6¾ square feet. Let us figure it out for a

KEWANEE	YEOMANS	LOUDEN
GARBAGE BURNERS AND BOILERS	BILGE PUMPS EJECTORS HOUSE PUMPS	SANITARY BARN EQUIPMENT

CALIFORNIA HYDRAULIC ENGINEERING & SUPPLY CO., 80 Fremont St., S. F.

Phone MISSION 4405

P. R. WARD Formerly Ward & Goodwin

GENERAL CONTRACTOR

981 GUERRERO STREET SAN FRANCISCO

ONE PIECE SANITARY DRAINBOARDS, SINKBACKS, FLOORS, WAINSCOTING, ETC.

GERMANWOOD FLOOR CO.

Phone West 4009 1621 EDDY STREET, SAN FRANCISCO

HOWARD CO.

CEMENT, ROCK, PLASTER, GRAVEL, BRICK and SAND

Phone Lakeside 27 1st and Market Sts., Oakland

G. W. COURTNEY

CONTRACTOR

Phone Franklin 4800 160 EDDY STREET, SAN FRANCISCO

L. G. BERGREN & SON

GENERAL CONTRACTORS

347 CALL BUILDING SAN FRANCISCO, CAL.

PLUMBING HEATING

NEIL H. DUNN

CONTRACTOR

786 ELLIS STREET, S. F. Phone Franklin 2187

J. B. CROWE

Glass of All Kinds

1372-74-76 TURK ST., SAN FRANCISCO Tel. West 1398

LANDSCAPE ARCHITECTS
NEAL T. CHILDS COMPANY Phone Sutter 4933
WE PLAN HOME GROUNDS AND REALTY TRACTS
TREE SURGERY AND CONSULTING FORESTRY
68 POST STREET
SAN FRANCISCO

home having a living room 14x14 feet, a dining-room 14x14 feet, and a hall 8x11 feet, or making a total of 480 square feet. This makes 71 carpet yards, and at a price of $2.50 a yard it amounts to $177.50.

This same space, 480 square feet, with $^3/_8$x2 inches clear plain white oak flooring, which is the very best grade in this thickness in the plain stock, can be bought, laid, scraped and finished complete for $88.00. This is $89.50, or 100 per cent less expensive than the old-fashioned carpet. There are two other grades in the plain stock that could be used that would even be more economical than the clear stock. If $^{13}/_{16}$ inch thickness clear plain white or red is used about 30 per cent more will cover the cost of same. This thickness is used chiefly in new buildings, whereas the $^3/_8$-inch thickness is used extensively for remodeling old houses that have old pine floors.

The prices of the carpet and oak flooring were based at Cincinnati, and were offered by a reputable department store and floor layer.

PROFITABLE WINTER WORK

During the slack season or winter months $^3/_8$-inch thickness oak flooring offers an excellent opportunity for carpenters and builders for laying in old homes where old pine floors are in use. Some canvassing is necessary to secure jobs, but when the work is started the entire neighborhood soon hears about it. A few floors laid in any neighborhood will bring about an abundant supply of jobs. Three-eighths-inch oak flooring can be laid in a room without disturbing any of the woodwork except the quarter around at the baseboard, and one room at a time can be laid and completely finished without disturbing the occupants to any great degree. Carpenters taking up this class of work should have complete information in regard to the different kinds and faces of oak flooring, as well as the proper methods of laying the floor, prices from the retail lumber dealer for the stock, nails, etc. A good reputation for first-class work is soon paraded and results in increased busi-

M & G REVOLVING SCREENS

are made in a variety of approved designs and in all sizes

OUR MANY YEARS OF EXPERIENCE IN THE MANUFACTURE OF SCREENING EQUIPMENT IS YOUR GUARANTEE OF A SUCCESSFUL INSTALLATION.

Meese & Gottfried Company

ENGINEERS AND MANUFACTURERS

Conveying, Elevating, Screening and Mechanical Power Transmitting Machinery

SAN FRANCISCO SEATTLE LOS ANGELES PORTLAND

Send for Catalog

CHARLES T. PHILLIPS
CONSULTING ENGINEER
PACIFIC BUILDING SAN FRANCISCO
HEATING VENTILATION WIRING ILLUMINATION

Fisher Flouring Mill, Seattle, Wash. 125 tons of black and galvanized Armco Iron used for roofing, ventilators, bins, hoppers and chutes.

The Iron That's Made To Last

demonstrates its superior quality in hundreds of uses.

ARMCO IRON Resists Rust

because of its remarkable Purity and the care and skill bestowed on every phase of its production.

Refuse Burner of Blue Annealed Armco Iron, built by the Walsh Construction Co. of Vancouver, B. C., for Hunting & Merritt Lumber Company.

AMERICAN ARMCO IRON

The trade mark ARMCO carries the assurance that iron bearing that mark is manufactured by The American Rolling Mill Company with the skill, intelligence and fidelity associated with its products, and hence can be depended upon to possess in the highest degree the merit claimed for it.

THE AMERICAN ROLLING MILL COMPANY

MIDDLETOWN, OHIO

Licensed Manufacturers under Patents granted to the International Metal Products Company

ARMCO Iron Sheets, Plates, Roofing, Pipe, Gutter and Metal Lath

Pacific Coast Sales Office — Monadnock Building, San Francisco; other Branch Offices in New York, Chicago, Pittsburgh, Cleveland, Detroit, St. Louis, Cincinnati, Atlanta, and Washington, D. C.

AN AMPLE STOCK OF ARMCO IRON IS CARRIED AT SAN FRANCISCO.

ness. There has been many a carpenter during the last few years who has taken up this line of work as a side-line, and who has developed into a specialist of laying oak floors in new homes, as well as remodeling and improving old homes by use of ⅜-inch oak flooring.

The manufacturers of oak flooring have books and folders imparting full information on how to lay oak floors, as well as the filling and finishing in varnish or wax.

The Atkinson Safety Window

There is probably no window on the market today which offers so many advantages as the "Atkinson," manufactured and marketed by the Atkinson Mill & Manufacturing Company, Second and Webster streets, Oakland. The window represents several years of study and experiment by the patentee, the senior Atkinson, and with its perfection he has turned over the sales agency to his two sons, who are thoroughly alive and keen to the possibilities of the window.

Until this window was perfected and placed before the public there was nothing on the market that had fully solved the many required needs, according to its manufacturers.

The Atkinson Safety window allows perfect ventilation without draught and also the full opening of the entire window space or the sash may be readily removed entirely if desired, giving a feature not obtained in any other window.

The Atkinson window is so perfectly balanced that a child can move it to any position desired and it may be cleaned on both sides from within the room.

It may be swung to either side, giving the full opening of the window.

Wind and dust is positively eliminated by this window as it may be clamped into its bevel jamb absolutely tight.

Outside screens can be placed and removed from within the room and awnings adjusted with ease without mussing or soiling curtains and shades.

This window is adaptable to all classes of buildings from the dainty bungalow to the most expensive office building, and the cost of frames and fittings are not in excess to the cost of the ordinary weight and cord window. Atkinson windows are especially recommended in hospitals, factories and particularly office buildings of great height, where cleaning windows is hazardous.

Awarded Steel Contract

The Golden Gate Iron Works, 1451 Howard street, San Francisco, has been awarded the contract for furnishing and erecting the structural steel and cast iron work for a one-story steel and wood machine shop building at the foot of Adeline street, Oakland, for the Moore & Scott Iron Works. The building complete will cost $65,000. The Golden Gate company's contract is for $9,100. Plans for the building were made by Engineer Leland S. Rossiner.

Embargo on Flat Cars Affects Concrete Industry.

ON OCTOBER 27, Robert S. Lovett, in the name of the President, issued from Washington, Priority Order No. 2, effective November 1, denying the use of open top freight cars for shipments of material and supplies "for the construction, maintenance, or repair of public or private highways, roadways, streets or sidewalks." The order in its entirety is printed below:

Priority Order No. 2.

Whereas by the Act of Congress entitled "An Act to amend the Act to Regulate Commerce, as amended, and for other purposes," approved August 10, 1917, it is provided that during the continuance of the war in which the United States is now engaged the President of the United States is authorized, if he find it necessary for the national defense and security, to direct that such traffic or such shipments of commodities as, in his judgment, may be essential to the national defense and security shall have preference or priority in transportation by any common carrier by railroad, water, or otherwise; and

Whereas by virtue of the power conferred upon him by said Act, the President has designated the undersigned as the person through whom the orders and directions authorized by said Act shall be given; and

Whereas, it has been made to appear and the President, through the undersigned, finds that open top cars (other than flat cars and cars assigned to work service) suitable for the transportation of coal, coke, ore, limestone, sugar beets, sugar cane, sorghum cane, and raw materials for use in the metal, sugar and fertilizer industries, and other commodities necessary to the national defense and security are being utilized in the transportation of the less essential commodities and articles hereinafter specified to such an extent as materially to interfere with the transportation of the aforesaid commodities required in the conduct of industries necessary in the prosecution of the present war, and that it is necessary for the national defense and security that priority should be accorded coal, coke, ore, limestone, sugar beets, sugar cane, sorghum cane, and raw materials for use in the metal, sugar and fertilizer industries and other commodities required in the national defense and security, in the use of such cars over the commodities and articles hereinafter mentioned:

Now, therefore, by reason of the premises, the undersigned, in the name of the President, orders and directs that, on and after the first day of November, 1917, and until further order of the undersigned, all common carriers by railroad in the United States in the distribution of open top cars, other than flat cars, and in the transportation of freight in such cars shall deny the use of open top freight cars other than flat cars to shipments of the following commodities and articles, except in shipments for the United States Government, viz.:

1. Materials and supplies, other than coal, for the construction, maintenance, or repair of public or private highways, roadways, streets or sidewalks.

2. Materials and supplies, other than coal, for the construction, maintenance, or repair of theatres or other buildings or structures to be used for amusement purposes.

3. Materials and supplies, other than coal, for the manufacture of pleasure vehicles, furniture or musical instruments.

4. Passenger vehicles, furniture and musical instruments,

which articles the undersigned finds are not essential to the national defense and security.

In witness whereof and by virtue of the aforesaid Act of Congress and the order of the President of the United States, I hereunto sign my name this twenty-seventh day of October, 1917.

(Signed) ROBERT S. LOVETT.

A true copy.
RALPH B. FEAGIN, Secretary.

That the embargo on flat cars will interfere with highway construction is admitted by Chief Engineer Austin Fletcher of the California State Highway Commission. Contractors engaged in this work depend largely upon these cars to transport cement, gravel and sand used in road building. Motor trucks may be pressed into service where the haul is not too long. It is not thought the embargo will seriously affect construction of concrete buildings.

It may occur to those who have responsible charge of construction, maintenance and repairing of roads and streets that certain roads and streets should not be classed as "not essential," particularly those used for transportation of farm produce and merchandise.

It is reasonable to suppose that Judge Lovett's intention is not to unnecessarily impose hardship on communities which are in urgent need of road and street improvements and that he will entertain suggestions to modify this order on presentation of the facts.

Johns-Manville Akoustolith

An Acoustical Stone for Interior Facing

We are now able to offer architects an artificial stone—Johns-Manville Akoustolith—for use as an interior facing for acoustical purposes. Comparable in sound-absorbing power with the old corrective agencies, it removes limitations of design and finish and opens up a new field of wide possibilities.

Johns-Manville Akoustolith is a porous, fireproof, masonry material cast in blocks, tile or brick, for ashlar or vaulted surfaces. It can also be moulded in ornamental form. It possesses marked beauty of surface texture, and is light in weight. Supplied in a variety of stone colors.

H. W. JOHNS-MANVILLE CO.
of California
2nd & Howard Sts., San Francisco
Los Angeles Sacramento San Diego

VENEERED PANELS
Elm
Gum
Oak
Mahogany
Oregon Pine

FLOORING
T. & G. Oak
"Tofco"
Brand
T. & G.
Maple
"Wolverine"
Brand

LUMBER
Ash
Birch
White Cedar
Hickory
Plain Oak
Maple
Gum
Poplar
Mahogany
Red Gum
Spruce
Walnut
Quartered
Oak

MODERN PLUMBING FIXTURES

HAINES, JONES & CADBURY CO.
MAKERS OF PLUMBING SUPPLIES
1130-1144 RIDGE AVENUE PHILADELPHIA
BRANCHES - SAVANNAH AND SAN FRANCISCO
San Francisco Office and Showroom
857 Folsom Street

H. H. LARSEN, 101 Woodland Ave. N. LARSEN, 230 Haight St.

H. H. LARSEN & BRO.
MASONS and BUILDERS
Phone Douglas 4249 Office 62 POST ST., Room 331, San Francisco

E. E. CARNAHAN
1403 McAllister St., Phone West 3608

E. S. MULFORD
1282 Sacramento St., Phone Franklin 8776

CARNAHAN & MULFORD
GENERAL CONTRACTORS
Telephone Kearny 4195 504 LUNING BLDG. 45 Kearny St., San Francisco, Cal.

Atlas Heating and Ventilating Co., Inc.
ENGINEERS and CONTRACTORS
STEAM AND HOT WATER HEATING, FANS, BLOWERS, FURNACES, POWER PLANTS—SHEET METAL WORK
Phone Douglas 378 Fourth and Freelon Sts., Bet. Bryant & Brannan, SAN FRANCISCO.

J. W. BENDER ROOFING & PAVING CO.
(Members of Builders Exchange, 180 Jessie St. General Contractors Assn., 110 Jessie St.)
WATERPROOFING AND COMPOSITION ROOFING
MASTIC AND BITUMEN PAVING
General Offices:
576 Monadnock Building San Francisco Telephone Douglas 4657

HEATING VENTILATION
Automatic Sprinkler Systems
FLOOR AND WALL TILING
PLUMBING SHEET METAL WORK
SCOTT CO., INC.
SUCCESSOR TO JOHN G. SUTTON CO.
243 MINNA STREET SAN FRANCISCO

BARRETT & HILP
Concrete Construction & General Contractors
SHARON BUILDING SAN FRANCISCO SUTTER 4598

Dolan Wrecking & Construction Co.
(D. J. DOLAN)
Lumber, Lath, Nails, Shingles, Doors, Windows and Plumbing Supplies, New and Second Hand
Phone Market 4264 Office and Yard, 1607-1639 MARKET ST., SAN FRANCISCO

When writing to Advertisers please mention this magazine.

Simplex Silo Built of Oregon Pine

The Portland Lumber Company, which has absorbed the Santa Fe Lumber Company, is having splendid success as distributors of the Simplex silo, a large number having been sold throughout the State.

A silo is a great cylindrical structure, used for preserving and slightly fermenting green forage crops. The use of the silo vastly increases the succulency of the feed and as a result the stock takes to it with the greatest relish. The process of siloing preserves every particle of nutriment that existed in the green crop and the finished product.

The perfect silo must have several essential qualities and the merit of the structure is in proportion to its possession of these qualities.

It must be strong. The silage on the inside is heavy and during the process of fermentation it exerts an enormous outward pressure, eleven pounds to the square foot. From without, the winds and rains and general weather and atmospheric changes all wear upon the silo with telling effect unless it is made to withstand these forces.

It must be absolutely air tight. The spaces between the small pieces of cut fodder as it is placed in the silo carry just enough air (oxygen) to nourish the bacteria until they have done their work in the process. If any more air is admitted, the bacteria will become too numerous and the silage will rot.

The width and depth must be in perfect proportion so that the contents of the silo, pressing downwards from the top will exert just the correct even pressure to keep the mass solid and free of air.

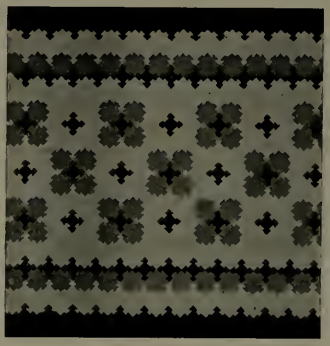
Among all the various kinds and makes of silos now in use, there is no reason to hesitate in saying that the Simplex silo, of the wood stave type, possesses the necessary qualities in the highest degree.

First quality unyielding Oregon pine staves are used. They are straight grained, as tough as steel and even more durable. They come full forty feet in length and this is as high as any silo need be. Hence, it is never necessary to use a spliced stave in a Simplex silo. This, of course, means a maximum of strength and air tightness.

The Simplex silo is made up to forty feet in height out of solid, one-piece staves.

Concrete Swimming Pool

Plans have been completed by Mr. John H. Thomas, First National Bank building, Berkeley, for a concrete swimming pool, 40x30 feet, and a private heating plant, to be built on the property of Mrs. W. E. Creed in Piedmont.



The Elevator Floor—

Whether in Office Building, Hotel or Department Store is subjected to an enormous amount of wear and tear.

Specify

Interlocking Rubber Tiling

and you've provided your client's building with a Durable, Economical, Practical material that is bound to give satisfaction.

Stock on hand for immediate delivery.

New York Belting and Packing Co.

New York

San Francisco Branch

519 MISSION STREET

Phone Douglas 1837

Small booklet of designs mailed on request.

TILING
MANTELS
GRATES

A. S. MANGRUM, Pres. & Mgr.

MANGRUM & OTTER
INCORPORATED

FURNACE AND STEAM HEATING

HOTEL AND KITCHEN OUTFITS
Stoves, Ranges, Refrigerators, Tin and Enameled Ware

Telephone Kearny 3155

561-563 MISSION ST.
SAN FRANCISCO

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC.
(Required by the Act of Congress, of August 24, 1912),

Of The Architect and Engineer of California, published monthly at San Francisco, California, for October 1st, 1917.

State of California, } ss.
County of San Francisco, }

Before me, a Notary Public in and for the State and County aforesaid, personally appeared A. I. Whitney, who, having been duly sworn according to law, deposes and says that she is the sole owner of The Architect and Engineer of California, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher.....A. I. WHITNEY
627 Foxcroft Bldg., San Francisco
Editor.....FREDERICK W. JONES
627 Foxcroft Bldg., San Francisco
Managing Editor .....None
Business Manager.....A. I. WHITNEY
627 Foxcroft Bldg., San Francisco

2. That the owner is A. I. WHITNEY, Sole Owner, 627 Foxcroft Bldg., San Francisco.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by her.

A. I. WHITNEY,
Publisher and Owner.

Sworn to and subscribed before me this 2nd day of October, 1917. SID S. PALMER,
Notary Public in and for the City and County
(SEAL) of San Francisco, State of California.

(My commission expires Dec. 31st, 1918.)

Enlarge Pittsburg Plant

The Great Western Electro-Chemical Company has increased its capital stock from $2,500,000 to $5,000,000, the money to be used in extensive additions and improvements to the company's plant at Pittsburg, Contra Costa county, California. The potassium chlorate plant is to be doubled and it is proposed to erect new buildings for the hardening of oils.

COST LESS WHEN READY FOR ACTUAL SERVICE

The illustration shows practically every part comprising these hangers—two telescoping steel tracks with steel ball between.

RELIANCE BALL BEARING DOOR HANGERS

are obviously extremely simple—a feature resulting not only in low maintenance cost but also low installation cost. Reliance hangers when installed practically cost no more than the cheap device, due to the difference in time and labor saved on the installation. Write for catalogue.

RELIANCE BALL BEARING DOOR HANGER COMPANY
Grand Central Terminal, NEW YORK

Pacific Coast Agents: B. V. Collins, Los Angeles, Cal.
Sartorius & Co., San Francisco, Cal.
Columbia Wire & Iron Works, Portland, Ore.
D. E. Fryer & Co., Seattle, Spokane & Tacoma, Wash.
Great Falls, Mont.

IT STANDS TO REASON

That a client will be satisfied, if his interior trim is finished with

BERRY BROTHERS
Architectural Finishes

because they are the best made.

LIQUID GRANITE — Floor Varnish.
LUXEBERRY WOOD FINISH — For interior trim.
LUXEBERRY WHITE ENAMEL — Whitest white, stays white.
LUXEBERRY SPAR — For front doors and exposed woodwork.

BERRY BROTHERS
INCORPORATED
World's Largest Varnish Makers

SAN FRANCISCO DETROIT WALKERVILLE, ONT.

Joost Brothers, Inc.

1053 Market St., San Francisco. Phone MARKET 891

GOING HUNTING?
Joost Bros. for Ammunition

BUILDING A HOUSE?
Joost Bros. for Locks

HOUSE NEED PAINTING?
Joost Bros. for Paints

CHRISTMAS SHOPPING?
Joost Bros. Have It.

Make Known Your Wants — We'll Supply Them

JOOST BROTHERS, Inc.

MARKET STREET, OPPOSITE JONES STREET

Schaw-Batcher Co.
Pipe Works

RIVETED STEEL PIPE
PRESSURE TANKS
STORAGE TANKS
WELL CASING

ALL KINDS HEAVY STEEL PLATE WORK

356 Market St., San Francisco Works, South San Francisco

Guaranteed Results in Waterproofing and Hardening Concrete, Brick, Stone, Etc.

BY THE

GOFFETTE Preparations

A perfectly successful, simple and inexpensive method of waterproofing and hardening concrete, brick and stone has been worked out by Prof. J. L. Goffette, a Belgian chemist and engineer of high standing.

MANUFACTURED BY

J. L. GOFFETTE CORPORATION

Factory and Warehouse, San Bruno Ave., San Francisco

THE GOFFETTE SALES ASS'N
General Sales Agents
276 Monadnock Bldg., San Francisco

R. E. G. KEENE
Distributor for Northern California
110 Jessie Street, San Francisco
Phone SUTTER 3580

Territory is open for responsible state or district sales agents, correspondence invited.
Address GOFFETTE SALES ASSOCIATION, 276 Monadnock Building, San Francisco.

Atkinson Safety Window

Mill
Second
and
Webster
Streets
Oakland

ESTABLISHED 1858

MUELLER

High Grade Faucets

FOR

BATH, LAVATORY AND SINK

Give Long Service, Cut Out Repairs, Fully Warranted

H. MUELLER MFG. CO.

589 Mission St., SAN FRANCISCO

C. DRUCKER J. C. JAMES

JAMES & DRUCKER

PLUMBING—HEATING CONTRACTORS

Phone Market 275

450 Hayes Street San Francisco

MARK-LALLY CO.

PLUMBING and STEAM SUPPLIES

"PERFECTION" FLUSH VALVES

SHOWROOMS AND OFFICE

235-249 2nd St., San Francisco CALIFORNIA

OAKLAND SAN JOSE Branches FRESNO STOCKTON

Phone Douglas 3224

Hunter & Hudson

ENGINEERS

Designers of Heating, Ventilating and Wiring Systems. Mechanical and Electrical Equipment of Buildings.

703 Rialto Bldg., San Francisco, Cal.

The McGilvray Stone Company

MASONRY AND STONE CONTRACTORS

OPERATING

Duntrune Quarry, at Sites, Colusa County, Cal.

The McGilvray Raymond Granite Co.

CONTRACTORS

For and Dealers in Granite Work of Every Description

Quarries at Raymond, Cal.

Offices, 634-666 Townsend Street, San Francisco

PHONE FRANKLIN 5598

THE TORMEY CO.

Versatile Decorators

General Painters

Wall Paper

1042 Larkin St., San Francisco, Cal.

Architectural Scale Models

EXECUTED IN

PLASTER and PLASTICINE

B. V. Gerow

509 23rd Avenue San Francisco

Phone Sutter 1687

THE RIGNEY TILE CO.

Successors to

CALIFORNIA TILE CONTRACTING CO.

ESTIMATES FURNISHED

Sheldon Building
1st and Market Sts. SAN FRANCISCO

"BLAZING" THE TRAIL

We've been doing it for many years—giving the Sportsman Better Value for Quality than he ever before received. *"Value at a Fair Price"* in everything for the Sportsman.

The Ellery Arms Company
583-85 MARKET ST
SAN FRANCISCO, CAL

SEND FOR CATALOG *The Sign of Quality*

National Surety Company of New York

ASSETS OVER $12,000,000.

The bonds of this Company are accepted by the United States Government in larger amounts than any other Surety Company in the World.

PACIFIC COAST DEPARTMENT,
105 MONTGOMERY STREET,
SAN FRANCISCO, CAL.
Frank L. Gilbert, Vice-President.
Phone, Sutter 2636

KEWANEE WATER SUPPLY SYSTEMS

A Perfect Water Supply to Country Homes, Hotels and Parks.

SIMONDS MACHINERY CO.
117-121 New Montgomery St., San Francisco

Interior Decorations a Specialty
Drapes, Sketches, Color Schemes Furnished on Request

Golden Gate Decorating Co.

704 Polk Street, at Eddy, San Francisco. Tel. Prospect 2685
R. L. McQUADE, Manager

Expert Designers in Home Decorations

House Painting, Graining, Glazing
Expert Paper Hanging
Apartment and Hotel Work a Specialty
Prompt Service—All Work Guaranteed

A. J. FORBES & SON

Established in San Francisco in 1850

Office and Factory, 1530 FILBERT ST., S. F.
Builders Ex. Box 236

Bank, Store and Office Fittings

Special Furniture and Interior Woodwork

MAGNER BROTHERS

PAINT MAKERS

We have purchased the business of the Jones-Duncan Paint Company, including formulae and brands, and can now supply the trade with ALVALINE, CEMENTOLINE and other Jones-Duncan products, as well as our own well-known line of paints.

NEW ADDRESS: 414-424 Ninth St.
NEW TELEPHONE: Market 113.

When writing to Advertisers please mention this magazine.

Planning the Private Garage

BOWSER Oil and Gasoline Storage Systems

Are a necessity always, to make the garage complete — make it safe — convenient — and a saving proposition.

BOWSER Equipment is Fire-Proof, Theft-Proof, Dirt-Proof and Loss-Proof. Because it is built to meet underwriters' inspections — with every convenience and oil saving device.

Write or 'phone us at once for complete information.

S. F. Bowser & Co., Inc., Fort Wayne, Ind.

San Francisco Office: 612 Howard Street, Telephone Douglas 4323

Sales Offices in All Centers — Representatives Everywhere

THE BRUNSWICK-BALKE-COLLENDER CO.'S

WHALE-BONE-ITE

REG. PAT. OFFICE

CLOSET SEATS

CUT SHOWS No. 16 91 SEAT
CONSTRUCTION OF B WHALE BONE ITE SEAT
A—NOTE THE COUNTER LAYER OF LAMINATION THIS RUNS ACROSS SEAT
B—RUNS LENGTHWISE

Sanitation — Durability

LIFE-LONG SERVICE combined in this hard rubber product. Note construction and that heavy thick rubber covering which is impervious; acid proof; one composite piece; does not crack or craze.

When cleaned with alcohol is made absolutely aseptic

Specify Whale-Bone-Ite Toilet Seats and give your client a fixture that positively fills the requirements.

Styles for all Standard Type Bowls.

Note Patent Concealed Type Hinges

THE BRUNSWICK-BALKE-COLLENDER CO. 623 SO. WABASH AVE CHICAGO

Sold by all Leading Plumbing Jobbers

There are more Industrial Buildings under construction and being planned in California today than ever before. Many of them are concrete.

Architects and Consulting Engineers specify and Contractors Buy ONLY Clean Gravel and Crushed Rock for their Concrete Mix.

California Building Material Co.

Office, 500-4 NEW CALL BUILDING, SAN FRANCISCO

Phone Sutter 4845 Plant at Niles, Cal.

Pack your Radiator Valves with

Palmetto Twist Packing

It can be unstranded to fit any size valve. It does not get hard.

H. N. COOK BELTING CO.

317-319 Howard St. San Francisco, Cal.

MOUNT DIABLO CEMENT
COWELL SANTA CRUZ LIME

ALL KINDS OF

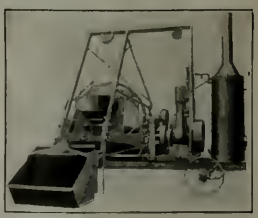
BUILDING MATERIALS

HENRY COWELL LIME AND CEMENT CO.

Phone Kearny 2095 No. 2 MARKET STREET, SAN FRANCISCO

AUSTIN IMPROVED CUBE CONCRETE MIXERS

Made the World's Best Records on the Panama Canal and the Los Angeles Aqueduct.
Built in ten sizes 2½ to 64 cubic feet capacity.
"Special machines for street and road paving."



MEMBER OF NATIONAL ASSOCIATION MIXER MNFRS

Our Mixer Capacities Based on N. A. M. M. Wet Batch Rating

Municipal Engineering and Contracting Co.

Main Office, Railway Exchange, CHICAGO
Represented by J. H. HANSEN & CO.
BALBOA BLDG., San Francisco. Telephone Douglas 726

"Definite Varnish Values"

There is no varnish that may be used anywhere and everywhere.

Each type of service requires a specific varnish to meet its specific requirements. And no other will serve!

STANDARD VARNISHES embrace a scientific STANDARD for every VARNISH need.

That is why

Standard Varnish *WORKS!*

STANDARD VARNISH WORKS

NEW YORK CHICAGO LONDON
SAN FRANCISCO PARIS BRUSSELS MELBOURNE
INTERNATIONAL VARNISH CO Limited TORONTO
LARGEST IN THE WORLD AND FIRST TO ESTABLISH DEFINITE QUALITY STANDARDS

GEO. S. MacGRUER
258 Connecticut St. Phone Park 7700

ROBERT M. SIMPSON
483 Monadnock Bldg. Phone Douglas 5889

MacGRUER & CO.
CONTRACTING PLASTERERS
PLAIN AND ORNAMENTAL

Members Builders Exchange
180 Jessie St. Phone Sutter 6700

SAN FRANCISCO

WM. F. WILSON COMPANY
MODERN SANITARY APPLIANCES
Special Systems of Plumbing for Residences, Hotels, Schools, Colleges, Office Buildings, Etc.
Phone Sutter 357
328-330 Mason Street, San Francisco.

A. C. SCHINDLER, President. CHAS. F. STAUFFACHER, Secretary
THE FINK & SCHINDLER CO.
Manufacturers of INTERIOR WOODWORK AND FIXTURES
BANK, OFFICE AND STORE FITTINGS
SPECIAL FURNITURE
218-228 THIRTEENTH ST
Bet. Mission and Howard Sts.
SAN FRANCISCO, CAL.
Telephone: Market 474

J. A. Nelson
J. C. Hurley
J. C. HURLEY CO.
Telephone Garfield 1959
CONSTRUCTING ENGINEERS
Heating and Ventilating Systems
509-511 Sixth St., SAN FRANCISCO

Underwriters' Labelled Fire Doors and Windows — Kalamein Interior Metal Doors and Trim — Metal Corner Bead — Metal Furniture, etc.

Capitol Art Metal Co., Inc.
Manufacturer of
SHEET METAL PRODUCTS
San Francisco Office, 400-406 NEW CALL BUILDING Tel. Sutter 6553
Factory, RICHMOND, CALIFORNIA

MILLER-ENWRIGHT CO.
SACRAMENTO, CAL.
PLUMBING SUPPLIES
STEAM and PIPE FITTINGS, VALVES, Etc.

PIPE—ALL KINDS
STEAM AND HOT WATER BOILERS
PENINSULAR HOT AIR FURNACES
Catalogues on Application

Phone Franklin 548
I. R. KISSEL
Decorator, Painter and Paperhanger
1747 SACRAMENTO ST., Bet. Polk St. and Van Ness Ave., SAN FRANCISCO

GRAVEL-ROCK
Quick Service any point in the San Joaquin Valley, Calif.
GRANT ROCK AND GRAVEL COMPANY
327-328 Cory Building
FRESNO, CALIF.

Clinton Welded Wire Fabric
CLINTON WIRE LATH

L. A. NORRIS COMPANY

Phone Kearny 5375 140 Townsend Street, San Francisco

August F. Fick Albert E. Fick

FICK BROTHERS

PAINTERS, PAPER-HANGERS AND DECORATORS

Dealers in
Paints, Oils, Varnishes, Glass

475 HAIGHT ST., San Francisco
Phone Park 4428—Res. Park 2148

GLASS BRICK has been found to possess both artistic and structural merits. Manufactured in any desired tone bright or subdued a substitute for Clay Brick for Exterior Walls of Hotels, Apartment Houses and Hospitals.
CALIFORNIA GLASS BRICK COMPANY, 228 Grant Ave., San Francisco, Cal.
GLASS WALL TILE, GLASS FLOOR TILE AND GLASS BASE Phone, Garfield 2042

Architects and Building Contractors

THE BINDING OF YOUR MAGAZINES and PERIODICALS IS OUR SPECIALTY

Expert Plate and Map Mounting

THE HICKS-JUDD COMPANY
BOOKBINDERS

51-65 FIRST STREET SAN FRANCISCO, CAL.

BEAVER BLACKBOARD
BEAVER GREENBOARD
SCHOOL FURNITURE
AND SUPPLIES—
OFFICE, BANK AND
COURTHOUSE FURNITURE—
THEATRE AND
AUDITORIUM SEATING
Rucker-Fuller Desk Co.
677 Mission St., SAN FRANCISCO, CAL.
120 So. Spring St., LOS ANGELES, CAL.
432 - 14th Street - OAKLAND, CAL.

Phone Franklin 1006
Alex. Coleman
CONTRACTING
PLUMBER
706 Ellis Street, San Francisco, Cal.

HEATING-PLUMBING
COMPLETE PLUMBING AND
HEATING SYSTEMS INSTALLED
IN ALL CLASSES OF BUILDINGS
ALSO POWER PLANTS
GILLEY-SCHMID CO., Inc.
198 OTIS STREET, SAN FRANCISCO.
Tel. MARKET 965

McCRAY
REFRIGERATORS
BUILT TO ORDER
FOR
Home, Restaurant, Hotel or Club
We Carry a Full Line of Stock Sizes
NATHAN DOHRMANN CO.
Selling Agents
Geary and Stockton Sts., San Francisco

CALIFORNIA
PHOTO-ENGRAVING CO.
DESIGNERS & ILLUSTRATORS
ENGRAVERS ARTISTS
BOOKLETS
FOLDERS
121
SECOND ST.
SAN FRANCISCO

THE SPENCER
TURBINE VAC-
UUM CLEANER
SAVES MONEY
Easily installed in old as well as new buildings—Operates by Electricity—Twelve sizes ranging from ½ to 40 horse power.
HUGHSON & MERTON CO.
AGENTS
Building Material Exhibit
77 O'Farrell Street
San Francisco

W. C. DUNCAN
& CO.
General Contractors
508 Sharon Bldg. San Francisco

Locks and Hardware
Representative for LOCKWOOD MFG. CO'S Builders' Hardware.
Display Rooms—7th and TOWNSEND STREETS, San Francisco
PACIFIC HARDWARE & STEEL CO.

The Granite Work on Eldorado County Courthouse; National Bank of D. O. Mills, Sacramento;—and Sen. Nixon Mausoleum, Reno, WAS FURNISHED BY

CALIFORNIA GRANITE COMPANY

Phone Sutter 2646 STONE CONTRACTORS

San Francisco Office, 518 Sharon Bldg. Main Office, Rocklin, Placer Co., Cal.
Quarries, Rocklin and Porterville Telephone Main 82

SARGENT
REG. U. S. PAT. OFF
BUILDING HARDWARE

BENNETT BROS.
514-516 Market Street
SAN FRANCISCO - CAL.

A. KNOWLES R. H. MATHEWSON

KNOWLES & MATHEWSON
CONTRACTORS AND ENGINEERS
Fireproof and Reinforced Concrete Construction
442 Call Bldg., San Francisco, Cal.
Phone Sutter 4712

O. BAMANN, President ERNEST HELD, Vice-President

HOME MANUFACTURING CO.
BANK, STORE AND OFFICE FITTINGS
FURNITURE AND HARDWOOD INTERIORS
CABINET WORK OF EVERY DESCRIPTION
543 and 545 BRANNAN ST. Phone Kearny 1514 San Francisco, Cal.

PACIFIC MANUFACTURING COMPANY
MILLWORK, SASH AND DOORS
Hardwood Interior Trim a Specialty
MAIN OFFICE:
SANTA CLARA, CAL.
SAN FRANCISCO OFFICE, 177 Stevenson Street
OAKLAND.....486 Tenth Street
BERKELEY.....2143 Center Street
SAN JOSE.....16 N. First Street

MOST PRACTICAL and ECONOMICAL ARRANGEMENT for the MODERN EFFICIENT EQUIPMENT OF SCHOOL STAGES FURNISHED GRATIS
We have equipped 95% of those built in California
REFERENCES — Orpheum, Pantages or Empress Theatres, San Francisco. All Turner & Dahnken Houses. Theatres everywhere. Manual Arts High, Los Angeles. Chaffee Union High, Ontario. Santa Cruz High School. Bakersfield High School. And over one hundred others.
HIGHEST GRADE ARTISTIC WORKMANSHIP—CONTINUOUS HELPFUL SERVICE.
EDWIN H. FLAGG SCENIC CO. 1638 LONG BEACH AVE., LOS ANGELES 510 PANTAGES BLDG., SAN FRANCISCO

Thomas Elam Grover C. Elam

THOMAS ELAM & SON
GENERAL CONTRACTORS
Office, Builders' Exchange
180 Jessie Street
SAN FRANCISCO
Phone Sutter 6700

A. LETTICH
365 FELL ST., SAN FRANCISCO
Telephone — Park 234
Plumbing

When writing to Advertisers please mention this magazine

FOR YOUR WATER-PROOFING SPECIFY **TIGEROIL**

EQUALLY GOOD FOR IRON, SHEET METAL OR WOOD
A POSITIVE RUST PREVENTIVE AND WOOD PRESERVER

"Tigeroil" is one of the best waterproofing coatings known. It forms a hard, elastic, non porous coating and is not affected by either salt or fresh water.

It is a transparent preparation, easily applied to metallic surfaces by spraying, brushing or dipping. It forms a thin waterproof coating, guaranteed to exclude all moisture and prevent rust. SAMPLES AND PRICES ON REQUEST. Manufactured by

PACIFIC COAST PAINT CORPORATION
OAKLAND, CALIFORNIA

General Offices and Factory — 1111 to 1119 E. 11th St. Phone Merritt 407
San Francisco Office — 112 Market St. Phone Sutter 2690

OUR LEADING CIGAR BRANDS

FLOR DEL MUNDO
ALL HAVANA TOBACCO

FLOR DE UPMANN
A MILD, PLEASING BLEND

Goldberg, Bowen & Co.
SAN FRANCISCO — OAKLAND

Four Routes East!

SUNSET ROUTE: Along the Mission Trail, and through the Dixieland of song and story. To New Orleans via Los Angeles, El Paso, Houston, and San Antonio. Southern Pacific Atlantic Steamship Line, sailing New Orleans to New York.

OGDEN ROUTE: Across the Sierras and over the Great Salt Lake Cut-off. To Chicago via Ogden and Omaha; also to St. Louis via Ogden, Denver and Kansas City.

SHASTA ROUTE: Skirting majestic Mount Shasta and crossing the Siskiyous. To Portland, Tacoma and Seattle.

EL PASO ROUTE: The "Golden State Route" through the Southwest. To Chicago and St. Louis via Los Angeles, Tucson, El Paso, and Kansas City.

Oil Burning Locomotives
No Cinders, No Smudge, No Annoying Smoke
Unexcelled Dining Car Service

FOR FARES AND TRAIN SERVICE ASK ANY AGENT

Southern Pacific

Write for folder on the Apache Trail of Arizona.

You will always remember your Eastern Trip

IF YOU TRAVEL VIA
"THE SCENIC ROUTE"

WESTERN PACIFIC
DENVER & RIO GRANDE

THROUGH THE FEATHER RIVER CANYON AND ROYAL GORGE

2 — TRAINS DAILY — 2

— FOR —

SALT LAKE CITY, DENVER, KANSAS CITY, ST. LOUIS, CHICAGO

AND

ALL EASTERN POINTS

Ask Any WESTERN PACIFIC Agent

or

BODE K. SMITH, General Passenger Agent, 961 Mills Building, San Francisco

INSURANCE SURETY BONDS

J. T. COSTELLO CO.

INSURANCE BROKERS

216 Pine Street, San Francisco Phone Sutter 188

Capital $1,000,000 CALIFORNIA DEPARTMENT Surplus $4,014,186.62

THE FIDELITY AND CASUALTY COMPANY OF NEW YORK

Prompt Service for

BONDS AND CASUALTY INSURANCE

203-206 Merchants Exchange Building SAN FRANCISCO, CAL.

ANY PLACE ANY TIME PROMPTLY "We Serve You"

ROBERTSON & HALL

GENERAL INSURANCE

Phone Sutter 2750 First National Bank Building, San Francisco

Telephone Sutter 5231 Member Insurance Brokers' Exchange

FRED H. BOGGS

INSURANCE

Foxcroft Building, 68 Post Street SAN FRANCISCO

CONTRACT BONDS

Fidelity and Surety Bonds of every kind.

C. K. BENNETT, Manager

FIDELITY AND DEPOSIT COMPANY OF MARYLAND

Telephone Kearny 1452 701 Insurance Exchange, San Francisco, Calif.

PACIFIC DEPARTMENT

Globe Indemnity Company

BONDS and CASUALTY INSURANCE for CONTRACTORS

120 Leidesdorff Street Phone Sutter 2280 SAN FRANCISCO

C. D. VEZEY O. G. LAWTON

LAWTON & VEZEY

BUILDING CONSTRUCTION

PHONE LAKESIDE 91 206 PLAZA BUILDING, OAKLAND

STOCKHOLM & ALLYN

GENERAL CONTRACTORS

Telephone Douglas 4657 Monadnock Building, San Francisco

Phone Kearny 3526

A. H. Bergstrom
Eric Lange

LANGE & BERGSTROM
BUILDING CONTRACTORS
(ESTABLISHED 1900)

207-210 Sharon Bldg. San Francisco

THE FISH FUEL SYSTEM
The Safest, Cleanest, Hottest Fuel on Earth

This SYSTEM supplies Heat, Light and Power at Lowest Cost. A Commercial Plant in operation at 50-54 – 8th St., San Francisco. Telephone Market 4070.

UNION GAS-ELECTRIC COMPANY
PALACE HOTEL SAN FRANCISCO

Member Builders' Exchange
180 Jessie Street
Telephone Sutter 6700

Residence 2909 California Street
Telephone Fillmore 1427

C. C. MOREHOUSE
Plain and Ornamental PLASTERING. Imitation STONE WORK of All Kinds
Exterior CEMENT PLASTERING. Metal FURRING and LATHING
MODELING and CASTING. STUCCO WORK

Office and Shop: 872 FOLSOM ST., San Francisco
TELEPHONE SUTTER 6509

ARTHUR ARLETT
BUILDING CONSTRUCTION

CALL BUILDING SAN FRANCISCO

When writing to Advertisers please mention this magazine.

ALFRED H. VOGT
Formerly FOSTER VOGT COMPANY
CONTRACTOR
231 Builders Exchange Building SAN FRANCISCO

Phone KEARNY 3021
GEORGE A. BOS
GENERAL CONTRACTOR
CONSULTING ENGINEER
HEARST BUILDING
SAN FRANCISCO

P. A. Palmer Peter Petersen W. L. Kelley O. G. Hoaas
PALMER & PETERSEN
Contracting Engineers
774-776 Monadnock Building SAN FRANCISCO, CAL.

Residence 2887 GREEN STREET Res. Phone, West 9451 Office Phone, Sutter 3580
P. MONTAGUE CO.
TEAMING AND GRADING
Office: General Contractors' Assn. 110 Jessie Street, San Francisco

C. L. WOLD Office Phone Sutter 4971 JOSEPH DUNN
C. L. WOLD COMPANY
GENERAL CONTRACTORS
75 SUTTER STREET, Cor. Montgomery, SAN FRANCISCO
GENERAL CONTRACTORS ASSOCIATION Phone Sutter 3580

HOUGHTON CONSTRUCTION CO.
Engineering and Construction
SPECIALIZING IN REINFORCED CONCRETE, RAILWAY and INDUSTRIAL CONSTRUCTION
Main Offices, Flatiron Bldg., San Francisco

J. D. HANNAH
Contractor and Builder
OFFICE: 725 Chronicle Building
San Francisco, Cal.
Telephone Douglas 895
BUILDERS EXCHANGE, 180 JESSIE STREET

D. ZELINSKY & SONS
INCORPORATED
PAINTERS AND DECORATORS
420 TURK STREET, SAN FRANCISCO

UNITED STATES STEEL PRODUCTS CO.

Rialto Building, San Francisco

SELLERS of the products of the American Bridge Co., American Sheet and Tin Plate Co., American Steel and Wire Co., Carnegie Steel Co., Illinois Steel Co., National Tube Co., Lorain Steel Co., Shelby Steel Tube Co., Tennessee Coal, Iron and Railroad Co., Trenton Iron Co.

MANUFACTURERS OF

Structural Steel for Every Purpose — Bridges, Railway and Highway — "Triangle Mesh" Wire Concrete Reinforcement — Plain and Twisted Reinforcing Bars — Plates, Shapes and Sheets of Every Description — Rails, Splice Bars, Bolts, Nuts, etc. — Wrought Pipe, Valves, Fittings, Trolley Poles — Frogs, Switches and Crossings for Steam Railway and Street Railway — "Shelby" Seamless Boiler Tubes and Mechanical Tubing—"Americore" and "Globe" Rubber Covered Wire and Cables — "Reliance" Weatherproof Copper and Iron Line Wire—"American" Wire Rope, Rail Bonds, Springs, Woven Wire Fencing and Poultry Netting — Tramways, etc.

United States Steel Products Co.

OFFICES AND WAREHOUSES AT

San Francisco - Los Angeles - Portland - Seattle

HERMAN T. LUDWIG
Building Construction
Phone Valencia 2539 636 Jessie Street, Near 7th, San Francisco

GEO. W. BOXTON & SON
General Contractors
Office, 1233 HEARST BUILDING SAN FRANCISCO, CAL.
Telephone Sutter 1601

Phone Kearny 381 J. M. Morrison F. H. Masow
MASOW & MORRISON
GENERAL CONTRACTORS
BUILDING CONSTRUCTION
518-522 Monadnock Bldg. San Francisco

Res. Mill Valley, Telephone Mill Valley 240 Member of General Contractors Association
HARVEY A. KLYCE
GENERAL BUILDING CONTRACTOR
408 New Call Building, SAN FRANCISCO Phone Douglas 3280

BURT T. OWSLEY
GENERAL CONTRACTOR
CALL-POST BUILDING SAN FRANCISCO

MacRORIE-McLAREN CO.
LANDSCAPE ENGINEERS and GENERAL NURSERYMEN
Office, 141 POWELL STREET, San Francisco
Nurseries at Beresford, San Mateo County

Phone Sutter 2581
LARSEN-SAMPSON CO.
BUILDING CONSTRUCTION
601 CROCKER BUILDING SAN FRANCISCO

GEO. FARRELL, BURLINGAME
Res. Phone Burlingame 1045
W. N. REED, 239 PRECITA AVE.
Res. Phone Valencia 6020
FARRELL & REED
CONTRACTORS
ROOM 334
BUILDERS' EXCHANGE
Telephone Sutter 450
185 STEVENSON STREET
SAN FRANCISCO

Fuller's Factory White Enamel

An intense White Enamel Finish.

Adapted for use on interior walls and ceilings of Factories and Industrial Plants. The Enamel dries with a hard, brilliant gloss and by reason of its light reflecting properties has economic value.

For every specific purpose for which Factory White Enamel is adapted it is the best protective, sanitary and germ proof coating that can be made.

Light lessens nerve strain and stimulates effort consequently Employees work to better advantage in well lighted rooms.

Conserve the sight by proper light

USE

Factory White Enamel

W. P. Fuller & Co.

MANUFACTURERS

SAN FRANCISCO
PUBLIC LIBRARY

THE ARCHITECT AND ENGINEER OF CALIFORNIA

PUBLISHED IN SAN FRANCISCO
NINETEEN HUNDRED AND SEVENTEEN
VOLUME LI NUMBER 3

RECENT WORK OF

LOUIS CHRISTIAN MULLGARDT

ARCHITECT

F.A.I.A.

ONE DOLLAR PER COPY

DECEMBER, 1917

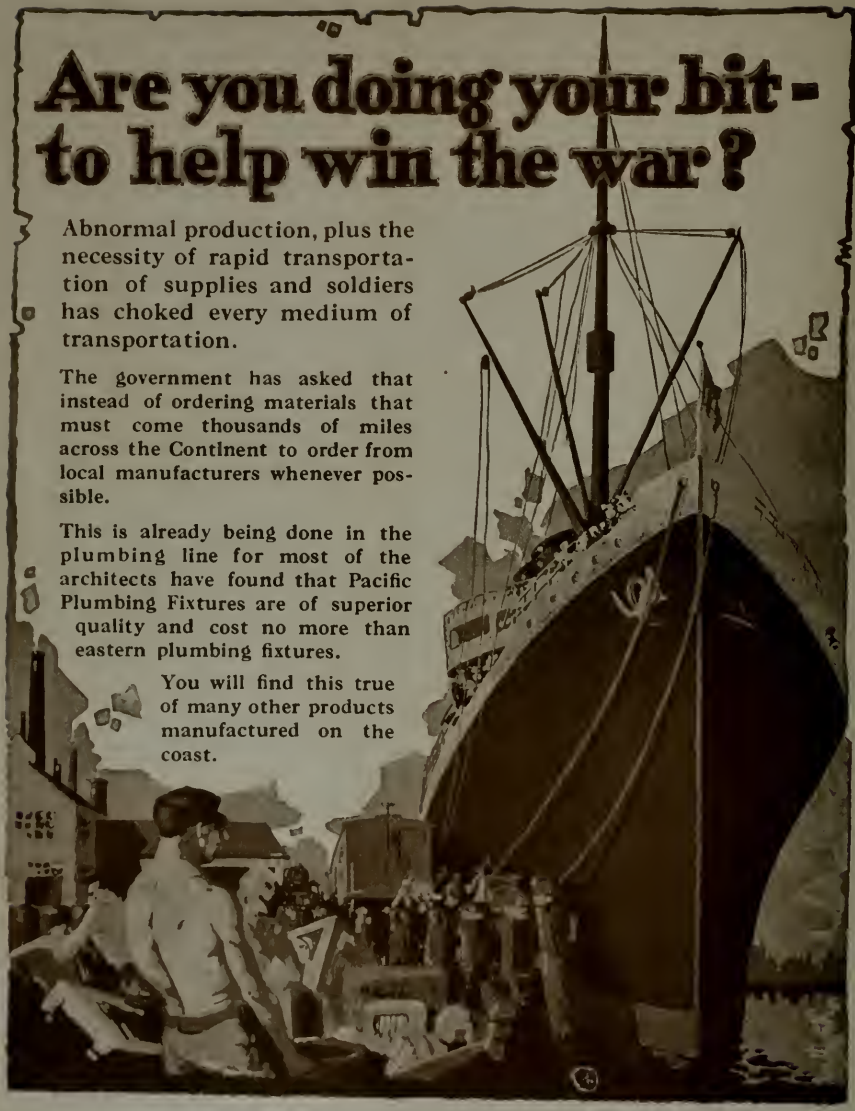
Are you doing your bit - to help win the war?

Abnormal production, plus the necessity of rapid transportation of supplies and soldiers has choked every medium of transportation.

The government has asked that instead of ordering materials that must come thousands of miles across the Continent to order from local manufacturers whenever possible.

This is already being done in the plumbing line for most of the architects have found that Pacific Plumbing Fixtures are of superior quality and cost no more than eastern plumbing fixtures.

You will find this true of many other products manufactured on the coast.



How about your window?

The Ideal Window is one that will operate in any size frame—wood or metal --the HAUSER is such a window--easy to install—a positive protection against rain, dust and wind.

Hauser Reversible Window Co.

OFFICE AND FACTORY:

157 MINNA STREET, SAN FRANCISCO

Phone, Kearny 3706

Specify Fan Shell Beach Sand and Del Monte White Sand

for a Perfect Stucco Finish.

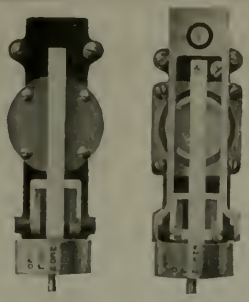
This shows the possibilities of Concrete Construction with Del Monte White Sand as one of the ingredients for a perfect cement finish.

Pacific Improvement Company

CROCKER BLDG.

San Francisco

Phone Sutter 6130



INTERMEDIATE POSITIVE

The Above Types of THERMOSTATS for VENTILATION and DIRECT RADIATION Respectively, are less than five inches long and represent

JOHNSON (Heat / Humidity) CONTROL

Write us about them

JOHNSON SERVICE CO.

800 Chamber of Commerce Bldg., Portland, Ore.
1104 White Building, Seattle, Wash.
604 Citizens Bank Bldg., Los Angeles, Cal.
149 FIFTH ST., SAN FRANCISCO, CAL.

THE PERFECTION DISAPPEARING BEDS

The Last Word in Efficiency, Simplicity and Adaptability

Full Line of Oscillating Beds, Disappearing Beds, Recess Beds, Wall Beds

PERFECTION DISAPPEARING BED CO.

Telephone Sutter 3367

739 Mission Street, San Francisco

THE HYLOPLATE BLACKBOARD

SCHOOL FURNITURE
Auditorium Seating

MAPS
GLOBES
ATLASES

C. F. WEBER & CO.

365 Market Street
SAN FRANCISCO

222-224
S. Los Angeles St.
LOS ANGELES

100 W. Commercial
Row, RENO, NEV.

124 W. Washington
Street, PHOENIX, ARIZ.

FOXCROFT BUILDING, 68 Post Street, San Francisco. Offices Single and in Suite.

GOODS OF HM&S QUALITY

Typical Holbrook, Merrill & Stetson Bath Room, which may be seen under pressure at their Uptown Display Room, 64 Sutter street, San Francisco.

GOOD PLUMBING is as essential to a Building as a Watertight Roof or a Substantial Foundation. Good Plumbing means Comfort, Health, Refinement. When an Architect specifies HOLBROOK, MERRILL & STETSON Plumbing he knows his Client will enjoy all these benefits and he has the further assurance that back of the goods is a guarantee of *Quality* that has been a trade-mark with this firm since the days of the Pioneer.

HOLBROOK, MERRILL & STETSON

DEALERS IN

PLUMBERS' SUPPLIES, IRON PIPE AND FITTINGS, METALS
STEAM, WATER AND HOT AIR HEATING APPARATUS
STOVES, RANGES AND KITCHEN UTENSILS

Main Office and Warehouse
SIXTH, TOWNSEND AND BLUXOME STREETS, SAN FRANCISCO

Finished With Cabot's Old Virginia White
Hays & Hoadley, Architects, N. Y.

Another Beautiful Residence Finished With

Cabot's "Old Virginia White"

It gives the "Whitewash Effect"—a cool, soft white that is as brilliant as new whitewash, and at the same time as clean and lasting as paint, without the painty coating. For all rough lumber and some dressed lumber, as well as other whitewashable surfaces.

SAMUEL CABOT, Inc., Mfg. Chemists, Boston, Mass.

Cabot's Creosote Stains, Waterproof Cement, and Brick Stains
"Quilt" Conservo Wood Preservative, Damp-Proofing
Protective Paints, Waterproofing, etc.

Pacific Building Materials Co., San Francisco
Mathews Paint Company, Los Angeles
S. W. R. Dally, Seattle
Timms, Cress & Co., Portland

COURTEOUS CONTINUOUS PACIFIC GAS AND ELECTRIC COMPANY RELIABLE

GAS IS THE CLEANEST AND

MOST EFFICIENT FUEL

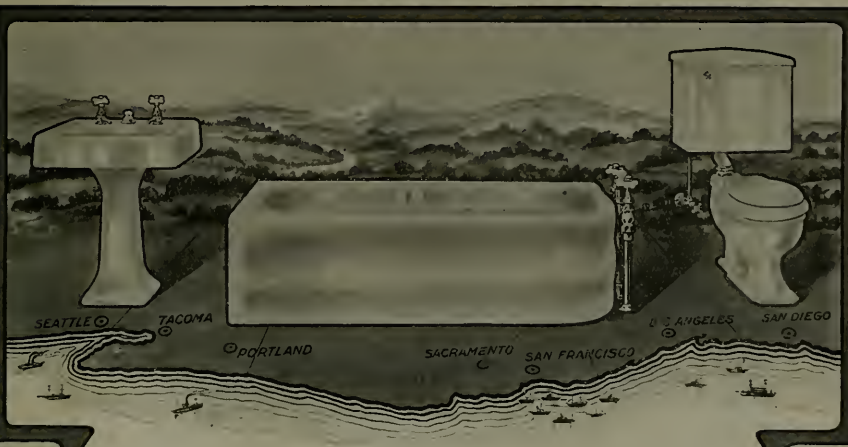
A MATCH AND

"PACIFIC SERVICE"

WILL GIVE YOU

CONTINUOUS SERVICE

Pacific Gas and Electric Company
San Francisco District
445 Sutter Street, San Francisco, Cal.



The "Standard" on the Pacific Coast

"Standard" Plumbing Fixtures were used in the pioneer days of the West. Their use and our sales and service organization have grown with the West.

Promoted at first only by friendly architects who knew "Standard" Plumbing Fixtures from past experience, we have through resulting expansion of business begun and continuously added to a thoroughly capable service organization covering the Pacific Coast and Hawaiian Islands backed by sales office, display rooms and large warehouses located for your service.

The average of 750 cars of "Standard" Plumbing Fixtures used annually on the Coast means thorough representation throughout California, Oregon, Washington, Nevada, Idaho, Utah, Arizona and the Hawaiian Islands.

Having helped to build, we take pride in the West and in serving it well.

Our representatives are subject to your call—we welcome opportunity to demonstrate the quality and extent of the "Standard" line and facilities for prompt deliveries.

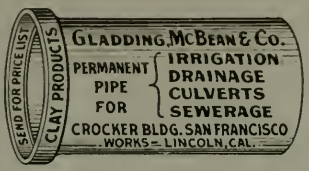
Standard Sanitary Mfg. Co.

A National institution with large local investments

San Francisco – Warehouses – Los Angeles

Your interests are ours

Making us "At Home" on the Pacific Coast.



RAYMOND GRANITE COMPANY

Incorporated

Owning and operating at Knowles, Madera County, the largest Quarry in the world.

CONTRACTORS FOR STONE WORK

OF EVERY DESCRIPTION

Designers and Manufacturers of Exclusive Monuments and Mausoleums.

Main Office and Yard:

Number 1 and 3 Potrero Avenue, - SAN FRANCISCO, CALIFORNIA.

Also at Number 612-614 Homer Laughlin Building, Los Angeles.

QUALITY SAND & ROCK CO.

Successor to SARATOGA CRUSHED ROCK COMPANY
and BAKER-MACDONALD CO.

CONCRETE ROCK AND CLEAN SHARP SAND

Crushed, Washed and Screened and in any size desired

SPECIALLY PREPARED SELF-BINDING ROCK

LOW FREIGHT RATE TO POINTS ON PENINSULAR RAILWAY

400-CUNARD BLDG., SAN FRANCISCO
Phone Douglas 2748

Quarry: Saratoga, Santa Clara Co.

703 First National Bank Building, SAN JOSE. Phone S.J.4620

S. F. Metal Stamping Works

THEOPHILE LAHAYE

ORNAMENTAL and PLAIN
Stamped, Spun, Hammered and Cast METAL

2269 FOLSOM ST. Phone Mission 2421 SAN FRANCISCO

Architects' Specification Index

(For Index to Advertisements, see next page)

ARCHITECTURAL SCULPTORS, MODELING, ETC.
G. Rognier & Co., 233 R. R. Ave., San Mateo.

ARCHITECTURAL TERRA COTTA
Gladding, McBean & Company, Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Company and United Materials Company, Crossley Building, San Francisco.

ASBESTOS ROOFING
Asbestos Protected Metal Co., Hobart Bldg., San Francisco.
H. W. Johns-Manville Co., San Francisco, Los Angeles and Portland, Ore.

AUTOMATIC SPRINKLERS
Scott Company, 243 Minna St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

BANK FIXTURES AND INTERIORS
Fink & Schindler, 218 13th St., San Francisco.
A. J. Forbes & Son., 1530 Filbert St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco.
Home Mfg. Co., 543 Brannan St., San Francisco.
Rucker-Fuller Desk Co., 677 Mission St., San Francisco.

BLACKBOARDS
C. F. Weber & Co., 365 Market St., San Francisco, Los Angeles and Reno, Nevada.
Beaver Blackboards and Greenboards, Rucker-Fuller Desk Company, Coast agents, 677 Mission St., San Francisco, Oakland and Los Angeles.

BOILERS
Franklin Water Tube Boiler, General Machinery and Supply Co., 39 Stevenson St., San Francisco.

BOOK BINDERS AND PRINTERS
Hicks-Judd Company, 51-65 First St., San Francisco.

BRASS GOODS, CASTINGS, ETC.
H. Mueller Manufacturing Co., 589 Mission St., San Francisco.

BRICK—PRESSED, PAVING, ETC.
Gladding, McBean & Company, Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Livermore Brick Company, pressed, glazed and enameled, etc., Livermore, Cal.
United Materials Co., Crossley Bldg., San Francisco.
California Brick Company, Niles, Cal.

BRICK AND CEMENT COATING
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.
Wadsworth, Howland & Co., Inc. (See Adv. for Pacific Coast Agents.)
Paraffine Paint Co., 34 First St., San Francisco.
R. N. Nason & Co., 151 Potrero Ave., San Francisco.

BRICK STAINS
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Armorite and Concreta, manufactured by W. P. Fuller & Co., all principal Coast cities.

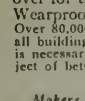
BUILDERS' HARDWARE
Bennett Bros., agents for Sargent Hardware, 514 Market St., San Francisco.
Pacific Hardware & Steel Company, San Francisco, Oakland, Berkeley, and Los Angeles.
Joost Bros., agents for Russell & Erwin Hardware, 1053 Market St., San Francisco.

BUILDING MATERIAL, SUPPLIES, ETC.
Pacific Building Materials Co., 523 Market St., San Francisco.
C. Jorgensen, Crossley Bldg., San Francisco.
The Howard Company, First and Market Sts., Oakland.

CEMENT
Mt. Diablo, sold by Henry Cowell Lime & Cement Co., 2 Market street, San Francisco.
"Golden Gate" Brand, manufactured by Pacific Portland Cement Co., Pacific building, San Francisco.

CEMENT EXTERIOR WATERPROOF PAINT
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See distributing agents in advertisement.)
Mauerene Likwid Sement, sold by the Imperial Company, Monadnock Bldg., San Francisco.
Armorite, sold by W. P. Fuller & Co., all principal Coast cities.
Imperial Waterproofing, manufactured by Brooks & Doerr, Reed Baxter, agent, Merchants National Bank Bldg., San Francisco.
Paraffine Paint Co., 34 First St., San Francisco.

CEMENT EXTERIOR FINISH
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co., (See list of Distributing Agents in adv.)
Concreta, sold by W. P. Fuller & Co., all principal Coast cities.



Master Builders Method

Master Builders Method — with Master Builders Concrete Hardner — is standard practice the world over for the construction of concrete floors that are Dustproof, Wearproof and Waterproof. More than 21,000 satisfied users. Over 80,000,000 sq. ft. in every-day use. Makes the ideal type of floor for all buildings where floor service is essential and the elimination of dust is necessary. Send for our "Primer"—a complete text book on the subject of better concrete floors. Sent FREE, without obligation.

THE MASTER BUILDERS COMPANY

Makers of Master Builders Concrete Hardner; Master Builders Red Concrete Hardner; Master Builders Black Concrete Hardner; Roadyte Concrete Hardner for Concrete Roads; Sanisteal Liquid Concrete Hardner.

Main Office and Works: CLEVELAND, OHIO.

AGENTS

R. H. Hoskins
Spokane, Wash.
Raymond C. Grant
Helena, Mont.
F. S. Cook & Co.
Portland, Ore.
C. Roman Co.
San Francisco, Cal.
A. E. Banks,
Los Angeles, Cal.
S. A. Roberts & Co.
Salt Lake City, Utah

An Index to the Advertisements

	Page
American Mail Chute	30
American Marble & Mosaic Co.	36
American Oil Burner	134
American Rolling Mill	125
Arlett, Arthur	144
Asbestos Protected Metal Co.	117
Atkinson Window	133
Atlas Heating & Ventilating Co.	128
Austin Cube Mixer	136
Aylsworth Agencies Co	13
Bacon, Ed. R	121
Baker-MacDonald Co	6
Barrett & Hilp	128
Bass-Hueter Co. 3rd Cover	
Bender Roofing Co	128
Bennett Bros	141
Bergren & Son, L. G	123
Bigley, Albert S	30
Biturine Company	36
Boggs, Fred H	143
Bos & O'Brien	145
Bowser & Co., S. F	135
Boxton & Son, Geo. W	147
Brininstool Co	22
Brooks & Doerr	115
Building Material Exhibit	26
Burlington Venetian Blind Co.	34
Butte Engineering Co	118
Buttonlath Mfg. Co	20
Cabot, Samuel (Inc.)	4
California Artistic Metal and Wire Co	32
California Brick Co	19
California Bldg. Material Co.	136
California Glass Brick Co	139
California Granite Co	141
California Hydraulic Engineering and Supply Co	123
California Photo Engraving Co.	140
California Plumbing Supply Co.	17
California Seed Co	16
Cannon-Phillips Co	21
Capitol Art Metal Co	138
Carnahan & Mulford	128
Central Iron Works	32
Childs, Neil T	124
City of Paris	117
Coleman, Alex	140
Collman, A. D	123
Cook Belting Co	136
Costello, J. T. Co	143
Courtney, G. W	123
Cowell Lime & Cement Co	136
Crane Co	31
Crowe, J. B	123
Cutler Mail Chute Co	30
Dolan Wrecking and Construction Co	128
Dudfield Lumber Co	15
Duncan, W. C	140
Dunn, Neil H	123
Dyer Bros	22
Eaton, W. L	11
Elam & Son	141
Electrical Construction Co	117
Ellery Arms Co	134
Fair Manufacturing Company	32
Falvy, A	34
Farrell & Reed	147
Fese System Co	141
Fick Bros	139
Fidelity & Casualty Co. of N.Y.	143
Fidelity & Deposit Co. of Maryland	143
Fink & Schindler Co., The	138
Fish Fuel System	144
Flagg, Edwin H., Scenic Co	141
Forbes & Son	134
Foxcroft Bldg	2
Fuller, W. P. Co	172
Gas & Electric Sales Co	117
General Gas Light Co	24
General Machy Supply Co.	28
Germanwood Floor Co	123
Gilley-Schmid Co	140
Gladding, McBean & Co	6
Glauber Brass Mfg. Co	18
Globe Indemnity Co	143
Goffette Sales Ass'n	132
Goldberg, Bowen & Co	136
Golden Gate Ornamental Iron Co	32
Goold & Johns	117
Grant Rock & Gravel Co	138
Haines, Jones & Cadbury	128
Hammond, M. E	18
Hannah, J. D	145
Hauser Reversible Window	1
Hicks-Judd Co	139
Hillard, C. J., Co	33
Hipolito Screen Co	34
Holbrook, Merrill & Stetson	3
Home Mfg. Co	141
Hooper Lumber Co	35
Houghton Construction Co	145
Howard Company	123
Hunt, Robt. W. & Co	121
Hunter & Hudson	133
Hurley Co., J. C	138
Ideal Heating Co	117
Illinois Engineering Co	35
Imperial Co	23
Improved Sanitary Fixture Co.	23
Jackson Sidewalk Lights	14
James & Drucker	133
Jarvis, T. P	35
Johnson Service Co	2
Joost Brothers	135
Jorgensen, C	32
Judson Mfg. Co	31
Kinnear Mfg. Co	36
Kissel, I. R	138
Klyce, Harvey A	147
Knowles & Mathewson	141
Kohler Co	131
Lange & Bergstrom	144
Larsen & Bro	128
Larsen, Sampson & Co	147
Lawton & Vezey	143
Lettich, A	141
Livermore Fire Brick Works	19
Los Angeles Pressed Brick Co.	29
Ludwig, H. T	147
MacGruer & Co	138
Magner Bros	134
Mark-Lally Co	133
Masow & Morrison	147
Mangrum & Otter	130
Marshall & Stearns Co	22
Master Builders	7
McElhinney Tile Co	12
McGilvray Stone Co	133
MacRorie-McLaren Co	147
Meese & Gottfried	124
Miller-Enwright Co	138
Montague, F	145
Morehouse, C. C	144
Mortenson Construction Co	32
Mott Iron Works	18
Mueller, H., Mfg. Co	133
Municipal Engineering Co	136
Musto Sons Keenan Co	13
Nason, R. N. & Co	12
Nathan, Dohrmann Co	140
National Mill & Lumber Co	122
National Surety Co	134
Ne Page, McKenny Co	117
Newbery Electric Co	141
New York Belting Co	116
Niles Sand Gravel & Rock Co.	36
Norris Co., L. A	139
Ocean Shore Iron Works	130
O'Hara & Livermore	113
Oak Flooring Service Bureau	25
Otis Elevator Co. Back Cover	
Owsley, Burt	147
Pacific Building Materials Co.	31
Pacific Coast Paint Corp'n	133
Pacific Coast Steel Company	27
Pacific Fire Extinguisher Co.	118
Pacific Gas & Electric Co	4
Pacific Hardware and Steel Co.	140
Pacific Imp. Co	1
Pacific Mfg. Co	141
Pacific Porcelain Ware Co. 2d Cover	
Pacific Rolling Mills	33
Palm Iron Works	31
Palmer & Petersen	145
Paraffine Paint Co. Back Cover	
Perfection Disappearing Bed Co	2
Patent Vulcanite Roofing Co.	14
Phillips, Chas. T	124
Pioneer Paper Co	9
Pitcher Door Hanger	122
Pittsburg Water Heater	21
Plant Rubber & Asbestos Works	142
Pope & Talbot	15
Portland Lumber Co	15
Prometheus Electric Co	18
Quality Sand and Rock Co	6
Ralston Iron Works	33
Ray, W. S. Mfg. Co. Inc	27
Raymond Granite Co	6
Reliance-Grant Elevator Equipment Co	112
Rigney Tile Co	134
Rix Compressed Air Co	23
Roberts Mfg. Co	118
Robertson & Hall	143
Rognier & Co	24
Rucker-Fuller Desk Co	140
Sartorius Company, Inc	23
S. P. Metal Stamping Works	6
S. P. Pioneer Varnish Wks. 3d Cover	
Schaw-Batcher Co	132
Scott Co	128
Schreiber & Sons Co	30
Schrader Iron Works	32
Sierra Electric Constr. Co	118
Simonds Machinery Co	134
Sloan Valve Co	25
Southern California Iron and Steel Co	27
Spencer Elevator Co	11
St. Francis Hotel	26
Standard Sanitary Mfg. Co	5
Standard Varnish Co	137
Stockholm & Allyn	143
Sunset Lumber Company	15
Thermic Eng. Co	117
Tittle, H. S	134
Tormey Co	133
Uhl Bros	9
United Materials Co	29
U. S. Metal Products Co	21
U. S. Steel Products Co	146
Van Fleet-Freear Co	10
Vermont Marble Co	24
Vogt, Alf. H	145
Wadsworth Howland	119
Ward, P. R	123
Walter, D. N. & E. & Co	10
Weber, C. P. & Co	2, 20
West Coast Wire & Iron Works	32
Western Blind & Screen Co.	20
Western Iron Works	33
Western Pacific	24
Western Photo Co	140
White Bros	111
Wilson, W. P., Co	138
Wold, C. L., Co	145
Woods, Huddart & Gunn	27
Zelinsky, D. & Sons	145

Roofing?
Don't take chances on inferior ma teria Buy the old reliable **Pioneer**
SPECIFY AND INSIST ON "PIONEER ROOFING"
PIONEER PAPER CO., Manufacturers **506-507 Hearst Bldg., San Francisco** Telephone Kearny 3788

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CEMENT EXTERIOR FINISH—Continued
Samuel Cabot Mfg. Co., Boston, Mass., agencies Oakland, Los Angeles, Portland, Tacoma, Spokane; and Pacific Building Materials Co., 523 Market St., San Francisco.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (See list of Distributing Agents in adv.)
Fuller's Concrete Floor Enamel, made by W. P. Fuller & Co., San Francisco.

CEMENT TESTS—CHEMICAL ENGINEERS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

CHURCH INTERIORS
Fink & Schindler, 218 13th St., San Francisco.

CHUTES—SPIRAL
Haslett Warehouse Co., 310 California St., San Francisco.

COLD STORAGE PLANTS
T. P. Jarvis Crude Oil Burning Co., 275 Connecticut St., San Francisco.

COMPOSITION FLOORING
Germanwood Floor Co., 1621 Eddy St., San Francisco.

COMPRESSED AIR CLEANERS
United Electric Co., Canton, O., mfr. of Tulc Cleaner, sold by San Francisco Compressed Air Cleaning Co., Sutter and Stockton Sts., San Francisco.

CONCRETE CONSTRUCTION
Clinton Construction Co., 140 Townsend street, San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Palmer & Petersen, Monadnock Bldg., San Francisco.

CONCRETE HARDNER
Master Builders Method, represented in San Francisco by C. Roman, Sharon Bldg.
Goffette Sales Association, 276 Monadnock Bldg., San Francisco.

CONCRETE MIXERS
Austin Improved Cube Mixer. J. H. Hansen & Co., California agents, 508 Balboa Bldg., San Francisco.
Foote Mixers. Sold by Edw. R. Bacon, 40 Natoma St., San Francisco.

CONCRETE REINFORCEMENT
United States Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.
Twisted Bars. Sold by Woods, Huddart & Gunn, 444 Market St., San Francisco.
Clinton Welded Wire Fabric, L. A. Norris Co., 140 Townsend St., San Francisco.
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Southern California Iron and Steel Company, Fourth and Mateo Sts., Los Angeles.

CONCRETE REINFORCEMENT—Continued.
Triangle Mesh Fabric. Sales agents, Pacific Building Materials Co., 523 Market St., San Francisco.

CONCRETE SURFACING
"Concreta." Sold by W. P. Fuller & Co., San Francisco.
Wadsworth, Howland & Co.'s Bay State Brick and Cement Coating. Sold by Jas. Hambly & Sons, Pacific Bldg., San Francisco and Los Angeles.

CONTRACTOR'S BONDS
Bonding Company of America, Kohl Bldg., San Francisco.
Globe Indemnity Co., 120 Leidesdorff St., San Francisco.
Fred H. Boggs, Foxcroft Bldg., San Francisco.
National Surety Co. of N. Y., 105 Montgomery St., San Francisco.
Fidelity & Casualty Co. of New York, Merchants Exchange Bldg., San Francisco.
Fidelity & Deposit Co. of Maryland,, Insurance Exchange, San Francisco.
J. F. Costello Co., 216 Pine St., San Francisco.
Robertson & Hall, First National Bank Bldg., San Francisco.

CONTRACTORS, GENERAL
Farrell & Reed, 183 Jessie St., San Francisco.
Barrett & Hilp, Sharon Bldg., San Francisco.
Carnahan & Mulford, 45 Kearny St., San Francisco.
Houghton Construction Co., Flatiron Bldg., San Francisco.
Bos & O'Brien, Hearst Bldg., San Francisco.
Larsen, Sampson & Co., Crocker Bldg., San Francisco.
J. D. Hannah, 725 Chronicle Bldg., San Francisco.
Stockholm & Allyn, Monadnock Bldg., San Francisco.
A. D. Collman, Jessie St., San Francisco.
Clinton Construction Company, 140 Townsend St., San Francisco.
L. G. Bergren & Son, Call Bldg., San Francisco.
Grace & Bernieri, Claus Spreckels Bldg., San Francisco.
Geo. W. Boxton & Son, Hearst Bldg., San Francisco.
W. C. Duncan & Co., 526 Sharon Bldg., San Francisco.
Harvey A. Klyce, New Call Bldg., San Francisco.
Knowles & Mathewson, Call Bldg., San Francisco.
C. L. Wold Co., 75 Sutter St., San Francisco.
P. R. Ward, 981 Guerrero St., San Francisco.
Lange & Bergstrom, Sharon Bldg., San Francisco.
Alfred H. Vogt, 231 Builders Exchange Bldg., San Francisco.
T. B. Gnodwin, 110 Jessie St., San Francisco.
Thos. Elam & Son, Builders Exchange, San Francisco.
Masow & Morrison, 518 Monadnock Bldg., San Francisco.
Lawton & Vezey, 206 Plaza Bldg., Oakland.

WALL PAPER ✤ Uhl Bros.
PHONE KEARNY 255 38 O'Farrell Street, San Francisco

MAS-OLEUM FLOORING (A Mastic Linoleum)
DUSTLESS, SEAMLESS, WATERPROOF, ACID and ALKALI PROOF
VAN FLEET - FREEAR COMPANY, Agents
Telephone Douglas 1227 120 JESSIE STREET, SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONVEYING MACHINERY
Meese & Gottfried, San Francisco, Los Angeles, Portland and Seattle.

CORK TILING, FLOORING, ETC.
Be-ver Cork Tile. Sold by W. L. Eaton & Co., 812 Santa Marina Bldg., San Francisco.
Van Fleet-Freear Company, 120 Jessie St., San Francisco.

CORNER BEAD
Capitol Art Metal Works, Call-Post Bldg., San Francisco.
United States Metal Products Co., 555 Tenth St., San Francisco; 750 Keller St., San Francisco.

CORK TILE AND INSULATION
Van Fleet-Freear Co., 120 Jessie St., San Francisco.

CRUSHED ROCK
Grant Gravel Co., Flatiron Bldg., San Francisco.
California Building Material Company, new Call Bldg., San Francisco.
Niles Sand, Gravel & Rock Co., Mutual Bank Bldg., San Francisco.
Quality Sand & Rock Co., 400 Cunard Bldg., San Francisco.

DAMP-PROOFING COMPOUND
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Biturine Co., 24 California St., San Francisco.
Imperial Waterproofing, mfrd. by Brooks & Doerr, Reed Baxter, agent, Merchants National Bank Bldg., San Francisco.
"Mauerene," sold by Imperial Co., Monadnock Bldg., San Francisco.
"Pabco" Damp-Proofing Compound, sold by Paraffine Paint Co., 34 First St., San Francisco.
Wadsworth, Howland & Co., Inc., 84 Washington St., Boston. (See Adv. for Coast agencies.)

DOOR HANGERS
McCabe Hanger Mfg. Co., New York, N. Y.
Pitcher Hanger, sold by National Lumber Co., 326 Market St., San Francisco.
Reliance Hanger, sold by Sartorius Co., San Francisco; D. F. Fryer & Co., B. V. Collins, Los Angeles, and Columbia Wire & Iron Works, Portland, Ore.

DRAIN BOARDS, SINK BACKS, ETC.
Germanwood Floor Co., 1621 Eddy St., San Francisco.

DRINKING FOUNTAINS
Haws Sanitary Fountain, 1808 Harmon St., Berkeley, and C. F. Weber & Co., San Francisco and Los Angeles.
Crane Company, San Francisco, Oakland, and Los Angeles.
Pacific Porcelain Ware Co., 67 New Montgomery St., San Francisco.

DUMB WAITERS
Spencer Elevator Company, 173 Beale St., San Francisco.
M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELECTRICAL CONTRACTORS
Butte Engineering Co., 683 Howard St., San Francisco.
Gas and Electric Sales Company, 441 Sutter St., San Francisco.
Goold & Johns, 113 S. California St., Stockton, Cal.
NePage, McKenny Co., 149 New Montgomery St., San Francisco.
Newbery Electrical Co., 413 Lick Bldg., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
H. S. Tittle, 245 Minna St., San Francisco.
Standard Electrical Construction Company, 60 Natoma St., San Francisco.

ELECTRICAL ENGINEERS
Chas. T. Phillips, Pacific Bldg., San Francisco.

ELECTRIC PLATE WARMER
The Prometheus Electric Plate Warmer for residences, clubs, hotels, etc. Sold by M. E. Hammond, Humboldt Bank Bldg., San Francisco.

ELEVATORS
Otis Elevator Company, Stockton and North Point, San Francisco.
Spencer Elevator Company, 126 Beale St., San Francisco.

ENGINEERS
Chas. T. Phillips, Pacific Bldg., San Francisco.
Hunter & Hudson, Rialto Bldg., San Francisco.

FIRE ESCAPES
Palm Iron & Bridge Works, Sacramento.
Western Iron Works, 141 Beale St., San Francisco.

FIRE EXTINGUISHERS
Scott Company, 243 Minna St., San Francisco
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.

FIREPROOFING AND PARTITIONS
Gladding, McBean & Co., Crocker Bldg., San Francisco.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

FIXTURES—BANK, OFFICE, STORE, ETC.
T. H. Meek & Co., 1130 Mission St., San Francisco.
The Fink & Schindler Co., 218 13th St., San Francisco.
A. J. Forbes & Son, 1530 Filbert St., San Francisco.
C. F. Weber & Co., 365 Market St., San Francisco, and 210 N. Main St., Los Angeles, Cal.

D. N. & E. WALTER & CO.
"SINCE 1858"
LINOLEUMS—CARPETS LARGE STOCKS CARRIED
Estimates furnished on request
100 STOCKTON STREET SAN FRANCISCO

"BE-VER" CORK TILING

Artistic = Quiet = Durable

MADE IN A WIDE RANGE OF COLORS — MODERATE IN PRICE

W. L. EATON & CO., Agents

112 Market St., San Francisco Telephone Garfield 372

See sample installation at The Building Material Exhibit, 77 O'Farrell Street

ARCHITECTS' SPECIFICATION INDEX—*Continued*

FLOOR TILE
New York Belting and Packing Company, 519 Mission St., San Francisco.
W. L. Eaton & Co., 112 Market St., San Francisco.

FLOOR VARNISH
Bass-Hueter and San Francisco Pioneer Varnish Works, 816 Mission St., San Francisco.
Fifteen for Floors, made by W. P. Fuller & Co., San Francisco.
Standard Varnish Works, Chicago, New York and San Francisco.
R. N. Nason & Co., San Francisco and Los Angeles.

FLOORS—COMPOSITION
"Vitrolite," for any structure, room or bath. Vitrolite Construction Co., 1490 Mission St., San Francisco.
Germanwood Floor Co., 1621 Eddy St., San Francisco.

FLOORS—HARDWOOD
Oak Flooring Bureau, Conway Bldg., Chicago, Ill.
Strable Mfg. Co., 511 First St., Oakland.

FLUMES
California Corrugated Culvert Co., West Berkeley, Cal.

FURNACES—WARM AIR
Miller-Enwright Co., 907 Front St., Sacramento.

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co., 612 Howard St., San Francisco.
Rix Compressed Air and Drill Company, First and Howard Sts., San Francisco.

GARBAGE CHUTES
Bradshaw Sanitary Garbage Chute, Aylsworth Agencies Co., 591 Mission St., San Francisco, sole agents for California.

GAS GRATES
General Gas Light Co., 768 Mission St., San Francisco.

GLASS
W. P. Fuller & Company, all principal Coast cities.

GRADING, WRECKING, ETC.
P. Montague Co., 110 Jessie St., San Francisco.
Dolan Wrecking & Construction Co., 1607 Market St., San Francisco

GRANITE
California Granite Co., Sharon Bldg., San Francisco.
Raymond Granite Co., Potrero Ave. and Division St., San Francisco.
McGilvray Raymond Granite Company, 634-666 Townsend St., San Francisco.

GRAVEL AND SAND
California Building Material Co., new Call Bldg., San Francisco.
Del Monte White Sand, sold by Pacific Improvement Co., Crocker Bldg., San Francisco.
Grant Rock & Gravel Co., Cory Bldg., Fresno.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., 704 Market St., San Francisco.
Quality Sand & Rock Co., 400 Cunard Bldg., San Francisco.

HARDWALL PLASTER
Henry Cowell Lime & Cement Co., San Francisco.
Empire Plaster sold by Pacific Portland Cement Co., Pacific Bldg., San Francisco.

HARDWARE
Joost Bros., agents for Russell & Erwin hardware, 1053 Market St., San Francisco.
Pacific Hardware & Steel Company, representing Lockwood Hardware Co., San Francisco.
Sargent's Hardware, sold by Bennett Bros., 514 Market St., San Francisco.

HARDWOOD LUMBER—FLOORING, ETC.
Dieckmann Hardwood Co., Beach and Taylor Sts., San Francisco.
Parrott & Co., 320 California St., San Francisco.
White Bros., cor. Fifth and Brannan Sts., San Francisco.
Strable Mfg. Co., 511 First St., Oakland.

HEATERS—AUTOMATIC
Humphrey Heater, sold by Gas and Electric Sales Co., 441 Sutter St., San Francisco.
Pittsburg Water Heater Co., 478 Sutter St., San Francisco.

HEATING AND VENTILATING
Gilley-Schmid Company, 198 Otis St., San Francisco.
Gas and Electric Sales Co., 441 Sutter St., San Francisco.
Mangrum & Otter, Inc., 507 Mission St., San Francisco.
Charles T. Phillips, Pacific Bldg., San Francisco.
James & Drucker, 450 Hayes St., San Francisco.
J. C. Hurley Co., 509 Sixth St., San Francisco.
Illinois Engineering Co., 563 Pacific Bldg., San Francisco.
Neil H. Dunn, 786 Ellis St., San Francisco.
William F. Wilson Co., 328 Mason St., San Francisco.
Pacific Fire Extinguisher Co., 507 Montgomery St., San Francisco.
Scott Company, 243 Minna St., San Francisco.

HEAT REGULATION
Johnson Service Company, 149 Fifth St., San Francisco.

HOLLOW TILE BLOCKS
Denison Hollow Interlocking Blocks. Cannon-Phillips Co., Forum Bldg., Sacramento, and the Howard Company, Oakland.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.

MADE IN SAN FRANCISCO

PASSENGER and FREIGHT ELEVATORS

INVESTIGATE OUR PRODUCT

SPENCER ELEVATOR COMPANY

126-128 Beale Street, SAN FRANCISCO Phone Kearny 664

McELHINNEY TILE CO.
Contractors for
FLOOR, WALL AND MANTEL TILE
See Display at Building Material Exhibit
1097 Mission Street, San Francisco — Park 6986

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HOSPITAL EQUIPMENT
Sierra Electric Construction Company, 619 Call Bldg., San Francisco.

HOSE
Plant Rubber and Asbestos Works, San Francisco.

HOSPITAL FIXTURES
J. L. Mott Iron Works, 135 Kearny St., San Francisco.

HOTELS
St. Francis Hotel, Union Square, San Francisco.

INGOT IRON
"Armco" brand, manufactured by American Rolling Mill Company, Middletown, Ohio, and Monadnock Bldg., San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 251 Kearny St., San Francisco.

INSURANCE
J. T. Costello Co., 216 Pine St., San Francisco.

INTERIOR DECORATORS
Albert S. Bigley, 344 Geary St., San Francisco.
City of Paris, Geary and Stockton Sts., San Francisco.
A. Falvy, 578 Sutter St., San Francisco.
The Tormey Co., 1042 Larkin St., San Francisco.
Fick Bros., 475 Haight St., San Francisco.
O'Hara & Livermore, Sutter St., San Francisco.

LANDSCAPE ARCHITECTS
Neil T. Childs Co., 68 Post St., San Francisco.

LAMP POSTS, ELECTROLIERS, ETC.
J. L. Mott Iron Works, 135 Kearny St., San Francisco.
Ralston Iron Works, 20th and Indiana Sts., San Francisco.

LANDSCAPE GARDENERS
MacRorie-McLaren Co., 141 Powell St., San Francisco.

LATHING MATERIAL
"Buttonlath," manufactured by Buttonlath Mfg. Co., office, Building Material Exhibit, San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co., 445 Sutter St., San Francisco.
The Fish Fuel System, 50 Eighth St., San Francisco.

LIME
Henry Cowell Lime & Cement Co., 2 Market St., San Francisco.

LINOLEUM
D. N. & E. Walter & Co., O'Farrell and Stockton Sts., San Francisco.

LUMBER
Dudfield Lumber Co., Palo Alto, Cal.

LUMBER—Continued
Hooper Lumber Co., Seventeenth and Illinois Sts., San Francisco.
Portland Lumber Co., 16 California St., San Francisco.
Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
Pope & Talbot, foot of Third St., San Francisco.
Sunset Lumber Co., Oakland, Cal.
California Redwood Association, 723 Call-Post Bldg., San Francisco.

MAIL CHUTES
Cutler Mail Chute Co., Rochester, N. Y. (See adv. on page 30 for Coast representatives.)
American Mailing Device Corp., represented on Pacific Coast by Waterhouse-Wilcox Co., Monadnock Bldg. Arcade., San Francisco.

MANTELS
Mangrum & Otter, 561 Mission St., San Francisco.

MARBLE
American Marble and Mosaic Co., 25 Columbus Square, San Francisco.
Joseph Musto Sons, Keenan Co., 535 N. Point St., San Francisco.
Vermont Marble Co., Coast branches, San Francisco, Portland and Tacoma.

METAL CEILINGS
San Francisco Metal Stamping & Corrugating Co., 2269 Folsom St., San Francisco.

METAL DOORS AND WINDOWS
U. S. Metal Products Co., 555 Tenth St., San Francisco.
Capitol Art Metal Works, New Call Bldg., San Francisco. Factory in Richmond.

METAL FURNITURE
Capitol Art Metal Works, New Call Bldg., San Francisco. Factory in Richmond.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.

MILL WORK
Dudfield Lumber Co., Palo Alto, Cal.
Pacific Manufacturing Company, San Francisco, Oakland and Santa Clara.
National Mill and Lumber Co., San Francisco and Oakland.
The Fink & Schindler Co., 218 13th St., San Francisco.

OIL BURNERS
American Standard Oil Burner Company, Seventh and Cedar Sts., Oakland.
S. T. Johnson Co., 1337 Mission St., San Francisco.
T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., San Francisco.
Fess System, 220 Natoma St., San Francisco.
W. S. Ray Mfg. Co., 218 Market St., San Francisco.

NASON'S OPAQUE FLAT FINISH A FLAT, WASHABLE OIL PAINT, made in soft Kalsomine tints—a practical article for WALLS, CEILINGS, Etc. Economical and Durable. Agency TAMM & NOLAN COMPANY'S high grade Varnishes and Finishes, made on the Pacific Coast to stand our climatic conditions.
R. N. NASON & CO., Paint Makers
151 Potrero Ave.—SAN FRANCISCO—54 Pine Street
PORTLAND
SEATTLE
LOS ANGELES

CLARENCE E. MUSTO, Pres. JOSEPH B. KEENAN, Vice-Pres. GUIDO J. MUSTO, Sec'y & Treas.

JOSEPH MUSTO SONS-KEENAN CO.

Phone Franklin —6365— MARBLE

OFFICE AND MILLS: 535-565 North Point St., SAN FRANCISCO, CAL.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE
- American Art Metal Works, 13 Grace St., San Francisco.
- California Artistic Metal and Wire Co., 349 Seventh St., San Francisco.
- Fair Manufacturing Company, 617 Bryant St., San Francisco.
- Palm Iron & Bridge Works, Sacramento.
- Ralston Iron Works, 20th and Indiana Sts., San Francisco.
- C. J. Hillard Company, Inc., 19th and Minnesota Sts., San Francisco.
- Schreiber & Sons Co., represented by Western Builders Supply Co., San Francisco.
- Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
- West Coast Wire & Iron Works, 861-863 Howard St., San Francisco.

PAINT FOR CEMENT
- Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.) (See adv. in this issue for Pacific Coast agents.)
- Fuller's Concreta for Cement, made by W. P. Fuller & Co., San Francisco.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

PAINT FOR STEEL STRUCTURES, BRIDGES, ETC.
- Biturine Company, 24 California St., San Francisco.
- Pacific Coast Paint Corp'n, 1119 East Eleventh St., Oakland.
- Paraffine Paint Co., 34 First St., San Francisco.
- Premier Graphite Paint and Pioneer Brand Red Lead, made by W. P. Fuller & Co., San Francisco.

PAINTING, TINTING, ETC.
- I. R. Kissel, 1747 Sacramento St., San Francisco.
- D. Zelinsky & Sons, San Francisco and Los Angeles.
- The Tormey Co., 681 Geary St., San Francisco.
- Fick Bros., 475 Haight St., San Francisco.

PAINTS, OILS, ETC.
- The Brininstool Co., Los Angeles, the Haslett Warehouse, 310 California St., San Francisco.
- Bass-Hueter Paint Co., Mission, near Fourth St., San Francisco.
- Biturine Co., 24 California St., San Francisco
- Pacific Coast Paint Corp'n, 1119 East Eleventh St., Oakland.
- Magner Bros., 414-424 Ninth St., San Francisco.
- R. N. Nason & Company, San Francisco, Los Angeles, Portland and Seattle.
- W. P. Fuller & Co., all principal Coast cities.
- Standard Varnish Works, 55 Stevenson St., San Francisco.

PANELS AND VENEER
- White Bros., Fifth and Brannan Sts., San Francisco.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA
- Gladding, McBean & Co., Crocker Bldg., San Francisco.

PIPE COVERINGS
- Plant Rubber and Asbestos Works, San Francisco.

PLASTER CONTRACTORS
- C. C. Morehouse, Crocker Bldg., San Francisco.
- MacGruer & Co., 180 Jessie St., San Francisco

PLASTER EXTERIORS
- Buttonlath, for exterior and interior plastering, Building Material Exhibits, 77 O'Farrell St., San Francisco.

PLUMBING CONTRACTORS
- Alex Coleman, 706 Ellis St., San Francisco.
- A. Lettich, 365 Fell St., San Francisco.
- Neil H. Dunn, 786 Ellis St., San Francisco.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Scott Co., Inc., 243 Minna St., San Francisco.
- Wm. F. Wilson Co., 328 Mason St., San Francisco.

PLUMBING FIXTURES, MATERIALS, ETC
- California Steam & Plumbing Supply Co., 671 Fifth St., San Francisco.
- Crane Co., San Francisco and Oakland.
- Gilley-Schmid Company, 198 Otis St., San Francisco.
- Glauber Brass Manufacturing Company, 1107 Mission St., San Francisco.
- Holbrook, Merrill & Stetson, 64 Sutter St., San Francisco.
- Improved Sanitary Fixture Co., 632 Metropolitan Bldg., Los Angeles.
- J. L. Mott Iron Works, D. H. Gulick, selling agent, 135 Kearny St., San Francisco.
- Haines, Jones & Cadbury Co., 857 Folsom St., San Francisco.
- H. Mueller Manufacturing Co., Pacific Coast branch, 589 Mission St., San Francisco.
- Miller-Enwright Co., 907 Front St., Sacramento.
- Mark-Lally Co., 235 Second St., San Francisco, also Oakland, Fresno, San Jose and Stockton.
- Pacific Sanitary Manufacturing Co., 67 New Montgomery St., San Francisco.
- Standard Sanitary Mfg. Co., 149 Bluxome St., San Francisco.
- Wm. F. Wilson Co., 328 Mason St., San Francisco.
- Neil H. Dunn, 786 Ellis St., San Francisco.

POTTERY
- Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

POWER TRANSMITTING MACHINERY
- Meese & Gottfried, San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.

PUMPS
- Simonds Machinery Co., 117 New Montgomery St., San Francisco.
- Ocean Shore Iron Works, 558 Eighth St., San Francisco.

RAILROADS
- Southern Pacific Company, Flood Bldg., San Francisco.
- Western Pacific Company, Mills Bldg., San Francisco.

REFRIGERATORS
- McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton Sts., San Francisco.

BRADSHAW
SANITARY GARBAGE CHUTE
For full particulars see
AYLSWORTH AGENCIES CO.
591 Mission St. San Francisco Tel., Douglas 4405

Jackson's Patent Sidewalk Lights and "No Leak" Sidewalk Doors
FIRST AND BEST
P. H. Jackson & Co. 237 - 247 FIRST ST., SAN FRANCISCO
Tel. Kearny 1959

ARCHITECTS' SPECIFICATION INDEX—*Continued*

REVERSIBLE WINDOWS
Hauser Reversible Window Company, 157 Minna St., San Francisco.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
C. F. Weber & Co., 365 Market St., S. F.
Kinnear Steel Rolling Door Co., Pacific Building Materials Co., 523 Market St., San Francisco.
Wilson's Steel Rolling Doors, Waterhouse-Wilcox Co., Monadnock Bldg. Arcade, San Francisco.

ROOFING AND ROOFING MATERIALS
Asbestos Protected Metal Company, Hobart Building, San Francisco.
Niles Sand, Gravel and Rock Co., Mutual Bank Bldg., San Francisco.
"Malthoid" and "Ruberoid," manufactured by Paraffine Paint Co., San Francisco.
Pioneer Roofing, manufactured by Pioneer Paper Co., 513 Hearst Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.
Vulcanite Products—Vulcanite ornamental roofings and Vulcanite roofing shingles, sold by Patent Vulcanite Roofing Co., 16th and Texas Sts., San Francisco.

RUBBER TILING
New York Belting & Rubber Company, 519 Mission St., San Francisco.

SAFETY TREADS
Pacific Building Materials Co., 523 Market St., San Francisco.
C. Jorgensen, Crossley Bldg., San Francisco.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Co., 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co., 365 Market St., San Francisco; 512 S. Broadway, Los Angeles.
Rucker-Fuller Desk Company, 677 Mission St., San Francisco.

SCREENS
Hipolito Flyout Screens, sold by Simpson & Stewart, Dalziel Bldg., Oakland.

SEEDS
California Seed Company, 151 Market St., San Francisco.

SHEATHING AND SOUND DEADENING
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Paraffine Paint Co., 34 First St., San Francisco.

SHEET METAL WORK, SKYLIGHTS, ETC.
Asbestos Protected Metal Company, Hobart Bldg., San Francisco.
Capitol Sheet Metal Works, New Call Bldg., San Francisco. Works in Richmond.
U. S. Metal Products Co., 555 Tenth St., San Francisco.

SHINGLE STAINS
Cabot's Creosote Stains, sold by Pacific Building Materials Co., Underwood Bldg., San Francisco
Fuller's Pioneer Shingle Stains, made by W. P. Fuller & Co., San Francisco.

SIDEWALK LIGHTS
P. H. Jackson & Co., 237-47 First St., San Francisco.
Phoenix Sidewalk Light Co., 472 Monadnock Bldg., San Francisco.

STEEL TANKS, PIPE, ETC.
Schaw-Batcher Co. Pipe Works, 356 Market St., San Francisco.
Ocean Shore Iron Works, 558 Eighth St., San Francisco.

STEEL AND IRON—STRUCTURAL
Central Iron Works, 621 Florida St., San Francisco.
Dyer Bros., 17th and Kansas Sts., San Francisco.
Golden Gate Iron Works, 1541 Howard St., San Francisco.
Judson Manufacturing Co., 819 Folsom St., San Francisco.
Mortenson Construction Co., 19th and Indiana Sts., San Francisco.
Pacific Rolling Mills, 17th and Mississippi Sts., San Francisco.
Palm Iron & Bridge Works, Sacramento.
Ralston Iron Works, Twentieth and Indiana Sts., San Francisco.
U. S. Steel Products Co., Rialto Bldg., San Francisco.
Schrader Iron Works, Inc., 1247 Harrison St., San Francisco.
Southern California Iron and Steel Co., Fourth and Mateo Sts., Los Angeles.
Western Iron Works, 141 Beale St., San Francisco.

STEEL PRESERVATIVES
Bay State Steel Protective Coating, manufactured by Wadsworth, Howland Co. (See adv. for coast agencies.)
Paraffine Paint Co., 34 First St., San Francisco.
Biturine Company, 24 California St., San Francisco.

STEEL REINFORCING
Pacific Coast Steel Company, Rialto Bldg., San Francisco.
Southern California Iron & Steel Company, Fourth and Mateo Sts., Los Angeles; W. B. Kyle, San Francisco representative, Call Bldg.
Woods, Huddart & Gunn, 444 Market St., Sao Francisco.

STEEL ROLLING DOORS
Kinnear Steel Rolling Door Co., Pacific Building Materials Co., agents, 523 Market St., San Francisco.

STEEL SASH
"Fenestra," solid steel sash, manufactured by Detroit Steel Products Company, Detroit, Mich.

VULCANITE ROOFINGS
including
ROLLS, SHINGLES and ORNAMENTAL EFFECTS
PATENT VULCANITE ROOFING COMPANY
San Francisco Depot, 16th and Texas Sts. Phone Market 390

LATH, SHINGLES, SHAKES and POSTS, SASH, DOORS and MILL WORK
TIMBERS and SPECIALS KILN DRIED FINISH and FLOORING

SUNSET LUMBER COMPANY
DEALERS WHOLESALE AND RETAIL IN
PINE and REDWOOD LUMBER

PHONE OAKLAND 1820
YARDS AND OFFICE
OAK AND FIRST STS., OAKLAND, CAL.

PORTLAND LUMBER CO.

Yards { TRACY, CAL. BRENTWOOD, CAL.
Phone KEARNY 2074

PORTLAND LUMBER COMPANY
A. J. RUSSELL, Agent
LUMBER
SIMPLEX SILOS
SAGINAW SPECIAL SHINGLES
Ship Timbers, Oil Rigs and Special Bills Cut to Order.
16 California Street San Francisco, Cal.

Millwork Manufactured
and Delivered Anywhere
Plans or Lists sent us for Estimates will have Careful and Immediate Attention
DUDFIELD LUMBER CO.
Main Office, Yard and Planing Mill - PALO ALTO
JNO. DUDFIELD, President and Manager JOSEPH A. JURY, Secretary and Mill Supt

POPE & TALBOT
Manufacturers, Exporters and Dealers in
Lumber, Timber, Piles, Spars, etc.
Office, Yards and Planing Mills
859-869 THIRD ST., SAN FRANCISCO, CAL.
Mills, Port Gamble, Port Ludlow and Utsalady, Washington

ARCHITECTS' SPECIFICATION INDEX—*Continued*

STEEL WHEELBARROWS
Champion and California steel brands, made by Western Iron Works, 141 Beale St., San Francisco.

STONE
California Granite Co., 518 Sharon Bldg., San Francisco.
McGilvray Stone Company, 634 Townsend St., San Francisco.
Raymond Granite Company, 1 and 3 Potrero St., San Francisco.

STORAGE SYSTEMS—GASOLINE, OIL, ETC.
S. F. Bowser & Co., 612 Howard St., San Francisco.
Rix Compressed Air and Drill Co., First and Howard Sts., San Francisco.

TELEPHONE AND ELECTRIC EQUIPMENT
Aylsworth Agencies Company, 591 Mission St., San Francisco.

TELEPHONE SIGNALS
Sierra Electric Construction Co., Call-Post Bldg., San Francisco.

TEMPERATURE REGULATION
Johnson Service Company, 149 Fifth St., San Francisco.

THEATER AND OPERA CHAIRS
C. F. Weber & Co., 365 Market St., San Francisco.

TILES, MOSAICS, MANTELS, ETC.
Rigney Tile Company, Sheldon Bldg., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.
McElhinney Tile Co., 77 O'Farrell St., San Francisco.

TILE FOR ROOFING
Gladding, McBean & Co., Crocker Bldg., San Francisco.
United Materials Co., Crossley Bldg., San Francisco.

TILE WALLS—INTERLOCKING
Denison Hollow Interlocking Blocks, Forum Bldg., Sacramento.
Gladding, McBean & Co., San Francisco, Los Angeles, Oakland and Sacramento.

VACUUM CLEANERS
Palm Vacuum Cleaners, sold by Western Vacuum Supply Co., 1125 Market St., San Francisco.
Spencer Turbine Cleaner, sold by Hughson & Merton, 77 O'Farrell St., San Francisco.

VALVES
Sloan Royal Flush Valves. T. R. Burke, Pacific Coast agent, Wells Fargo Bldg., San Francisco.
Crane Radiator Valves., manufactured by Crane Co., Second and Brannan Sts., San Francisco.

VALVE PACKING
N. H. Cook Belting Co., 317 Howard St., San Francisco.

VARNISHES
Berry Bros., 250-256 First St., San Francisco.
W. P. Fuller Co., all principal Coast cities.
Pacific Coast Paint Corp'n, 112 Market St., San Francisco; Security Bank Bldg., Oakland.
R. N. Nason & Co., San Francisco, Los Angeles, Portland and Seattle.
Standard Varnish Works, San Francisco.
S. F. Pioneer Varnish Works, 816 Mission St., San Francisco.

VENETIAN BLINDS, AWNINGS, ETC.
Burlington Venetian Blinds, Burlington, Vt., and C. F. Weber & Co., 365 Market St., San Francisco.
Western Blind & Screen Co., 2702 Long Beach Ave., Los Angeles.

VITREOUS CHINAWARE
Pacific Porcelain Ware Company, 67 New Montgomery St., San Francisco.

WALL BEDS, SEATS, ETC.
Marshall & Stearns Co., 1154 Phelan Bldg., San Francisco.
Perfection Disappearing Bed Co., 739 Mission St., San Francisco.

WALL BOARD
"Amiwud" Wall Board, manufactured by Paraffine Paint Co., 34 First St., San Francisco.

WALL PAINT
Nason's Opaque Flat Finish, manufactured by R. N. Nason & Co., San Francisco, Portland and Los Angeles.
San-A-Cote and Vel-va-Cote, manufactured by the Brininstool Co., Los Angeles.

WALL PAPER
Uhl Bros., 38 O'Farrell St., San Francisco.
The Tormey Co., 681 Geary St., San Francisco.

WATER HEATERS—AUTOMATIC
Pittsburg Water Heater Co. of California, 478 Sutter St., San Francisco, and 402 Fifteenth St., Oakland.

WATERPROOFING FOR CONCRETE, BRICK, ETC.
Armorite Damp Resisting Paint, made by W. P. Fuller & Co., San Francisco.
Biturine Company, 24 California St., San Francisco.
Goffette Sales Corporation, Monadnock Bldg., San Francisco.
Imperial Co., Monadnock Bldg., San Francisco.
Imperial Waterproofing, mfrd. by Brooks & Doerr, Reed Baxter, agent, Merchants National Bank Bldg., San Francisco.
Pacific Building Materials Co., 523 Market St., San Francisco.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Wadsworth, Howland & Co., Inc. (See adv. for Coast agencies.)

WATER SUPPLY SYSTEMS
Kewanee Water Supply System—Simonds Machinery Co., agents, 117 New Montgomery St., San Francisco.

WHEELBARROWS—STEEL
Western Iron Works, Beale and Main Sts., San Francisco.

WHITE ENAMEL FINISH
"Gold Seal," manufactured and sold by Bass-Hueter Paint Company. All principal Coast cities.
"Silkenwhite," made by W. P. Fuller & Co., San Francisco.
"Satinette," Standard Varnish Works, 113 Front St., San Francisco.

WINDOWS—REVERSIBLE, CASEMENT, ETC.
Atkinson Safety Window at Building Material Exhibit, 77 O'Farrell street, San Francisco.
Hauser Reversible Window Co., 157 Minna St., San Francisco.

WIRE FABRIC
U. S. Steel Products Co., Rialto Bldg., San Francisco.

WOOD MANTELS
Fink & Schindler, 218 13th St., San Francisco.
Mangrum & Otter, 561 Mission St., San Francisco.

Now is the Time to lay out your Country
Place with the best the market affords in

TREES ∴ SEEDS ∴ BULBS

CALIFORNIA SEED COMPANY

AL. J. NEVRAUMONT, Manager
Phone Douglas 5895

151 Market Street, San Francisco

Specify the **Ruby California**

A Closet Particularly Adapted For Moderate Priced Residences, Apartments and Flats

White Vitreous China, Syphon Acting Washdown Bowl, with White Vitreous China Tank and Guaranteed Semi-Saddle, Post Hinge, Oak Seat

A Full Line of Plumbing Supplies,
Drainage Fittings, Soil Pipe and Fittings

— ALSO —

The Kelly & Jones Co. Valves and Fittings
Byers Guaranteed Wrought Iron Pipe
Standard and Extra Heavy Steel Pipe

Our New Shop is equipped to do all kinds of pipe work. Pipe up to twelve inches cut, threaded and made up as per sketch.

Write for Catalogue and Literature.

CALIFORNIA STEAM & PLUMBING SUPPLY CO.

Fifth and Bluxome Streets

Telephone Sutter 737

San Francisco **California**

MOTT PLUMBING FIXTURES

Architects and their clients are invited to visit our Showrooms, 135 Kearny St., San Francisco; D. H. GULICK, Sales Agent. Los Angeles Office, 1001 Central Building; J. R. MAYHEW, Sales Agent. Portland, Ore., Office, Sherlock Bldg.; F. J. KANE, Sales Agent. Seattle, Wash., Office, Securities Bldg.; P. C. WAACK, Sales Agent.

THE J. L. MOTT IRON WORKS
Established 1828

SPECIFY GLAUBER FAUCETS

not only because they are GUARANTEED FIVE YEARS, but because of the QUALITY which enables us to guarantee them.

The Jury of Awards at the P. P. I. E. gave us **Seven Medals**, not because we indemnify our users against trouble with our goods, but because **Glauber Quality Faucets** don't cause trouble.

Three hundred of the best buildings on the Pacific Coast are equipped with **Glauber Cocks.**

Send for illustrated specification book.

Main Office and Factory CLEVELAND, O.

Glauber Brass Mfg. Co.
567 Mission Street, San Francisco, Cal.

Eastern Branch 130 W. 32nd St. NEW YORK

For Modern RESIDENCES *and* APARTMENTS

PROMETHEUS

The Electric Food and Plate Warmer

Tenants of high-class apartments regard Prometheus as a household necessity—as much so in keeping meals warm as the refrigerator in keeping food cold. Owners are installing Prometheus as an additional means of securing new and holding old tenants

Prometheus keeps the meal steaming hot without injuring finest china. Wireless heating units of practically unlimited life, placed independent of shelves, are used exclusively.

THE PROMETHEUS ELECTRIC CO., Manufacturers
M. E. HAMMOND, 217 Humboldt Bank Building, San Francisco

THE AUSTIN CUBE MIXER

The cube mixing principle, inside breaker rods, renewable drum plates, and long lasting qualities, combine to make the AUSTIN-CUBE the most highly efficient mixer in the concrete mixing service.

NATIONAL MIXER MNFRS

AUSTIN-CUBES are made in sizes adapted to every class of concrete mixing service.

Municipal Engineering and Contracting Co.
BALBOA BLDG., San Francisco. Telephone Douglas 726
Sales Agent J. H. HANSEN & CO.
Main Office, Railway Exchange, CHICAGO

CALIFORNIA VITRIFIED BRICK

stands alone in its class among our Home Industries and is the best Paving Block made anywhere.

It is used on the streets of SAN FRANCISCO, OAKLAND, SAN JOSE, BERKELEY, SAUSALITO, LIVERMORE, SARATOGA, CALISTOGA and other California Cities.

Its use Insures Satisfactory and Permanent Pavements

INVESTIGATE NOW SAMPLES FURNISHED

California Brick Company

NILES, CALIFORNIA

Representatives at San Francisco and Oakland Exchanges

LIVERMORE PRESSED, MATT GLAZED AND ENAMELED BRICK

in a variety of colors including "Mottles," "Ruff," White, Ivory White, Cream, Grey, Green, Brown, Blue, etc., are designed to meet the requirements of Architects desiring permanent and unique effects.

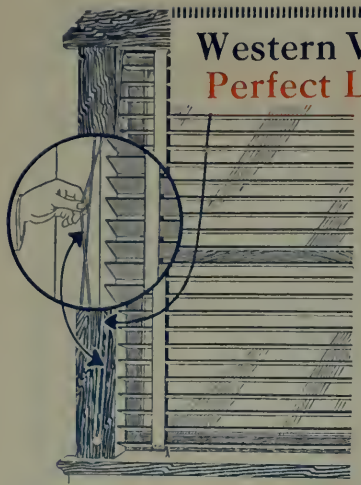
Full size sample sent on request.

LARGE PRODUCTION—ATTRACTIVE PRICES—PROMPT DELIVERIES

Livermore Fire Brick Works

LIVERMORE, CALIFORNIA

Representatives at San Francisco and Oakland Exchanges



Western Venetian Blinds *assure* Perfect Light and Ventilation

THE SLATS can be adjusted to Any Angle, supplying Light of the Exact Intensity Required. Easy to operate and will last as long as the building.

For Office Buildings, Municipal Buildings, Schools, Churches and Residences.

WESTERN BLIND & SCREEN CO.

2700 Long Beach Avenue
Los Angeles, - California

C. F. WEBER & CO., Agents
San Francisco Los Angeles Reno, Nev. Phœnix, Ariz.

Every Architect

and engineer who is interested in school construction will be interested in our new folder—"Buttonlath in Schools."

It proves conclusively the wonderful superiority of Buttonlath for use in public buildings; contains halftones of 17 new schools. Will be sent you free on request.

SOUND-PROOF WALLS

are a necessity in schools, where echoing and transmission of noises might easily disrupt the proper conduct of classes. Buttonlath has wonderful sound-deadening qualities; is remarkably fire resistant; is allowed wherever metal lath is allowed.

MANUFACTURED BY

BUTTONLATH MANUFACTURING CO.

Boyle and Vernon Avenues
LOS ANGELES, CAL.

77 O'Farrell Street
SAN FRANCISCO, CAL.

[illegible] is magazine.

FOR THE ARCHITECT

Who specifies a "PITTSBURG" Automatic Gas Water Heater — he is confident that his judgment will be commended.

FOR THE CUSTOMER

Who purchases a "PITTSBURG" Automatic Gas Water Heater — he is assured beyond a doubt of many years of satisfactory Hot Water Service.

PITTSBURG WATER HEATER COMPANY of California
478 Sutter St., San Francisco 402 15th St., Oakland

A Big Thing

New Model No. 65
"Pittsburg-Bungalow"
Automatic Water Heater,
Capacity three gallons
per minute.

"FIRE—A CRIME"

We are equipped with two Pacific Coast Factories to manufacture
METAL DOORS—Tin, Kalamein, Composite, Hollow Steel and Bronze.—Swinging, Sliding, Folding, Elevator, Van Kannel Revolving Doors, and Wilson's Steel Rolling Doors.
METAL WINDOWS—Underwriters, Hollow Metal of all kinds, Kalamein, Bronze and Steel Sash.
☞ See the SIMPLEX METAL WINDOW.

United States Metal Products Co.

OF THE PACIFIC COAST

55 Tenth St., San Francisco 750 Keller St., Los Angeles

Agents and Branches in all Coast Cities.

DENISON INTERLOCKING TILE

and all kinds of

CLAY PRODUCTS

Phone MAIN 2028

CANNON-PHILLIPS COMPANY

Incorporated

Successors to DENISON BLOCK COMPANY

Plant North Sacramento 920 FORUM BUILDING SACRAMENTO, CAL.

QUALITY PAINT PRODUCTS
Brininstool

San-a-Cote (GLOSS)
(CAN BE SCRUBBED)

AN INTERIOR WALL FINISH
For bath rooms, kitchens, hospitals, schools, office and public buildings. Ask dealers, owners, architects and contractors about this durable, sanitary, washable, economical wall covering.

Brininstool makes a paint for every purpose, and every can purposely good

THE BRININSTOOL CO., LOS ANGELES

COLOR GRINDERS AND PAINT MANUFACTURERS

Distributors—The Brininstool Co., care of Haslett Warehouse Co., 310 California St., San Francisco; Schutz Paint Co., Fresno, Cal.; Schneider, Chappell & Jones, Sacramento, Cal.; Salt Lake Glass & Paint Co., Salt Lake City, Utah; Griffin Paint Co., Ogden, Utah; Ernest Miller Wall Paper Co., 172 First St., Portland, Ore.; Hickox Crampton Paint Co., Tacoma, Wash.; Campbell Hardware Co., First and Madison Sts., Seattle, Wash.; Imperial Valley Hardware Co., El Centro, Calexico, Imperial, Brawley, Seeley; Spokane Hardware Co., Spokane, Wash.; Ellis Paint Co., Butte Mont.; Simons Paint and Paper Co., Missoula, Cal.

Comfort

we know is a first essential in the designing and building of beds. You can install our Oscillating Portal Wall Beds and be assured that they will give tenants absolute comfort and satisfaction. Eleven years of experience have taught us what springs to use, how to hang them and all the other little points that make for comfortable sleeping.

Our Wall Beds are as comfortable as the best bed you have ever slept in.

MARSHALL & STEARNS CO.

WALL BEDS

1152 PHELAN BUILDING — SAN FRANCISCO
1774 BROADWAY — OAKLAND

GEO. H. DYER, President — R. W. DYER, Vice-Pres. — W. J. DYER, Sec'y

DYER BROTHERS

Golden West Iron Works, Inc.

Structural Iron and Steel Contractors

ORNAMENTAL IRON WORK

Office and works:
17th and KANSAS STREETS

SAN FRANCISCO, CAL.
Phone Market 134

Cast Iron Entrance and Bronze Doors.
Lincoln High School, Portland, Oregon

EXECUTED BY

SARTORIUS COMPANY, Inc.
ORNAMENTAL IRON AND BRONZE
15th and Utah Sts., San Francisco

First National Bank Building
San Francisco

Willis Polk & Co.
Architects

Walls treated with

Mauerene Likwid Sement

NON-CHECKING
NON-STAINING
WATERPROOF

THE IMPERIAL COMPANY
717-719 Monadnock Bldg.
Phone Sutter 1341 SAN FRANCISCO

Stationary Outfit

To ARCHITECTS and ENGINEERS

The Public is tired of buying Gasoline by hidden measurement—All up-to-date equipments demand the VISIBLE Method of Supply.

DELANOY VISIBLE SYSTEM

Any station equipped with the visible apparatus will sell from 25 to 50 per cent more gasoline than by the ordinary method. Send for Circulars.

RIX COMPRESSED AIR & DRILL CO.
Sole Manufacturers
San Francisco Los Angeles

"THE BOUDOIR" (Reg. Trade Mark)
Pat. Dec. 1913, Jan. 1915

Examine any bathroom, or any plan of a bathroom, with three separate fixtures set in any of the customary ways.

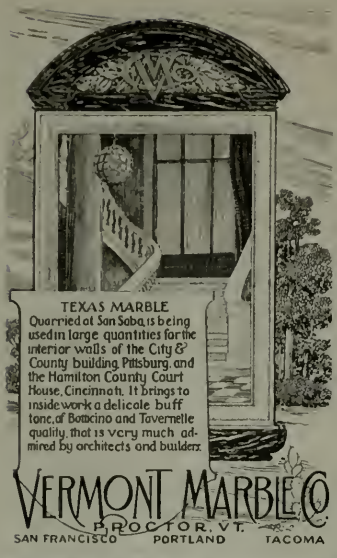
Cut out the separate lavatory, all its fittings, supply and waste pipes, trap, vent and connections. Sum up the cost of these; then

Substitute "THE BOUDOIR" Bath Fixture, with its large 20x24-inch pedestal lavatory, accessibly placed, taking no space usable for any other purpose.

Notice the improved appearance, additional room, the gained conveniences of a sitting shower, shampoo, washing in fresh running water, support in getting in and out of the bath tub, fewer fittings to polish and keep in order.

Prompt deliveries anywhere from our nearest Factory.

IMPROVED SANITARY FIXTURE COMPANY, 632 Metropolitan Bldg., Los Angeles, California, - U. S. A.


TEXAS MARBLE
Quarried at San Saba, is being used in large quantities for the interior walls of the City & County building, Pittsburg, and the Hamilton County Court House, Cincinnati. It brings to inside work a delicate buff tone, of Botticino and Tavernelle quality, that is very much admired by architects and builders.
VERMONT MARBLE CO.
PROCTOR, VT.
SAN FRANCISCO PORTLAND TACOMA

For That Empty Fireplace

The Humphrey Radiantfire

All the charm of an open fire
No odor — No ashes
A Gas Heater that heats.

GENERAL GAS LIGHT CO.
C. B. BABCOCK, Mgr.
768 Mission St. San Francisco

A BEAUTIFUL HOME—
IMPOSING ENTRANCE POSTS,
Fence and Garden Ornaments,
made of Cement, add an Indisputable Touch of Beauty and Feeling of Comfort to the Real Country House. The Fence, Posts, and Fruit Baskets shown in this picture were made by

G. Rognier & Co.

Garden Furniture, Flower Pots, Vases, Sun Dials, etc.

Designs Submitted
233 Railroad Ave., SAN MATEO, CAL.

You will always remember your Eastern Trip

IF YOU TRAVEL VIA
"THE SCENIC ROUTE"

WESTERN PACIFIC
DENVER & RIO GRANDE

THROUGH THE FEATHER RIVER CANYON AND ROYAL GORGE

2 — TRAINS DAILY — 2

— FOR —

SALT LAKE CITY, DENVER, KANSAS CITY, ST. LOUIS, CHICAGO

AND

ALL EASTERN POINTS

Ask Any WESTERN PACIFIC Agent
or
BODE K. SMITH, General Passenger Agent, 961 Mills Building, San Francisco

Beautiful Oak Floors

are in use everywhere and are a source of unlimited satisfaction and pride.

3/8-inch thickness **OAK FLOORING** offers a very **beautiful** and **durable** floor at a very **low cost.** It is the ideal flooring for laying over old pine floors in old buildings, as well as in new buildings over cheap sub-floors. When laid it has all the appearance of 13/16-inch stock. Winter months are the best time for laying the 3/8-inch over old floors, as it tends to create more work for the carpenters.

OAK FLOORING is **beautiful, distinctive** and **substantial** and rightfully deserves the name

America's Best Flooring

AMERICAN OAK FLOORING laid forty years ago in public buildings is still in good condition today after very hard service.

When you specify **OAK FLOORING** for any building you can rest assured that you have done a distinct service that will always reflect to your own credit.

Specify **AMERICAN OAK FLOORING** and satisfy your clients.

See our page 379—1917 Sweet's Catalogue. **Write for Folders.**

Oak Flooring Service Bureau

1603 UNION TRUST BLDG., CINCINNATI, OHIO

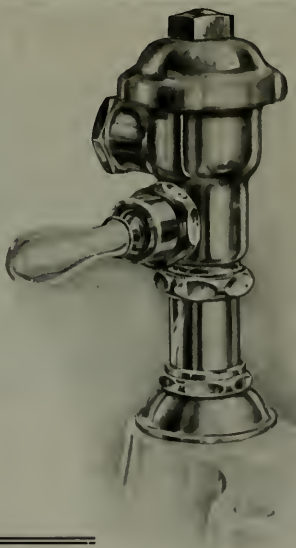
SLOAN VALVE COMPANY'S ROYAL FLUSH VALVES

Combine correct mechanical design and highest efficiency with ease of operation, extreme simplicity and remarkable durability.

Are furnished in a variety of styles, adaptable to a wide range of method of application and working conditions.

Moderate in cost to install—maintenance expense negligible. The ideal equipment for industrial, office, hotel and apartment buildings; schools, jails, comfort stations, etc.

You eliminate risk when you specify the Royal Flush Valve—its reputation is country-wide.



SLOAN VALVE COMPANY

Chicago, Ill.

or **624 Wells Fargo Building, San Francisco**

ANYTHING in the BUILDING LINE from Basement to Roof—You'll find it at the...

BUILDING MATERIAL EXHIBIT

77 O'Farrell Street, San Francisco — No trouble getting you information Mr. Architect, Mr. Owner. Call us up if you haven't time to drop in. We are at your service. No fees. Phone Sutter 5333.

"LOOK BEFORE YOU BUILD"

HOTEL ST. FRANCIS

SAN FRANCISCO

Most Beautifully Decorated Public Rooms in the World
European Plan from $2.00

Management :: :: :: JAMES WOODS

STEEL BARS FOR CONCRETE REINFORCEMENT

TWISTED SQUARES, PLAIN SQUARES AND ROUNDS
We Will Make Lump Sum Bids on Reinforcement Fabricated and Installed.

PIG IRON, COKE AND FERRO ALLOYS

WOODS, HUDDART & GUNN

444 MARKET STREET Tel. Sutter 2720 SAN FRANCISCO, CAL.

STEEL OPEN HEARTH BARS FOR CONCRETE REINFORCEMENT

Square Corrugated and Cold Twisted, Plain Rounds and Squares
-----MERCHANT STEEL-----
Flats, Angles, Channels, Rounds, Squares, Rivet & Bolt Steel, Structural Shapes

PACIFIC COAST STEEL COMPANY

PHONE SUTTER 1564

General Office, Rialto Bldg., San Francisco
Sales Office, " " " "
Sales Office, Union Oil Building, Los Angeles
Sales Office, Seattle, Wash.

ROLLING MILLS:
South San Francisco
Seattle, Wash. Portland, Ore.

"Havemeyer" Deformed STEEL BARS

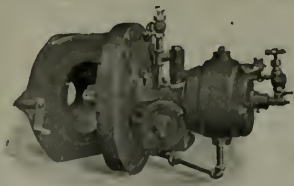
FOR REINFORCED CONCRETE CONSTRUCTION

Southern California Iron & Steel Co.

FOURTH AND MATEO STREETS
LOS ANGELES, CAL.

W. B. KYLE, New Call Building,
San Francisco Representative.

THE RAY OIL BURNING SYSTEM—1917 MODEL



Improvements: Enclosed motors, dust, oil and water proof; oil-cooled motor runs 75 per cent cooler; oil heated electrically. Only one place to lubricate for entire machine, and many more exclusive features. Send for catalogue.

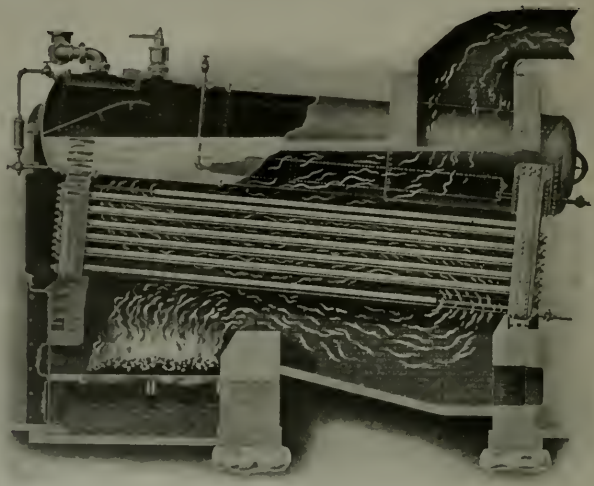
W. S. RAY MFG. CO.

Salesroom, 218-220 Market St., SAN FRANCISCO
Phone Kearny 199

Works, Bosworth, Milton & Rousseau, S. P. R. R., San Francisco. Phone Mission 6022

The FRANKLIN Water-Tube Boiler

COMPLYING WITH THE CALIFORNIA CODE



DESCRIPTION

Your Attention Invited

Safety Under High Pressure through proper choice of materials.

Unimpeded Circulation through correct design.

High Furnace Temperature, resulting in complete combustion.

Heating Surface properly disposed to absorb heat.

Easy Cleaning and Inspection from outside front and rear.

Hand-Hole Plate Joints tightened by internal pressure.

Method of Support, ideal for contraction and expansion.

Many Other Meritorious Features

INSTALLATIONS

YOUR INSPECTION INVITED

Y. M. C. A. Building, S. F.	3—104 H.P.	312 H.P.
St. Luke's Hospital, S.F.	2—150 H.P.	300 H.P.
St. Mary's Hospital, S. F.	2—135 H.P.	270 H.P.
University of Cal. Hospital, S. F.	2—165 H.P.	330 H.P.
Examiner Building, S. F.	2—119 H.P.	238 H.P.
Whitney Building, S. F.	2—143 H.P.	286 H.P.
Hotel Del Monte, Monterey	1—220 H.P.	220 H.P.
Shattuck Hotel, Berkeley	2— 90 H.P.	180 H.P.
Cal. Paper & Bd. Mills, Antioch	2—270 H.P.	540 H.P.
Cal. Paper & Bd. Mills, Antioch	3—190 H.P.	570 H.P.
Western Meat Co., S. F.	2—104 H.P.	208 H.P.
Oakland Meat Co., Oakland	1—143 H.P.	143 H.P.
Belmont School, Belmont	1—104 H.P.	104 H.P.
St. Joseph's Home	2—104 H.P.	208 H.P.
D. Ghiradelli & Co., S. F.	1—152 H.P.	152 H.P.
Rialto Bldg., S. F.	1—135 H.P.	135 H.P.
Fairmont Hotel, S. F.	2—104 H.P.	208 H.P.
Total		4404 H.P.

Send for Catalog "E"

SELLING AGENTS

GENERAL MACHINERY & SUPPLY CO.

39-51 Stevenson Street, San Francisco, Cal.

NORTHEAST BRANCH LIBRARY, LOS ANGELES
Hibbard & Cody, Architects

Covered with

No. 1 RED MISSION TILE

MANUFACTURED BY

Los Angeles Pressed Brick Company

FROST BUILDING, LOS ANGELES

UNITED MATERIALS COMPANY

CROSSLEY BUILDING, SAN FRANCISCO

Distributers for Northern California

When writing to Advertisers please mention this magazine

The GOLD MEDAL MAIL CHUTE

INSTALLED IN THE NEW SAN FRANCISCO CITY HALL AND THE WHITE MARBLE MERRITT BUILDING, LOS ANGELES

Given highest award at Panama-Pacific International Exposition, 1915.

Waterhouse-Wilcox Co.

California Representatives

8 Monadnock Bldg. (Arcade) SAN FRANCISCO

331 E. 4th Street, LOS ANGELES

F. T. CROWE & CO. Seattle

Agents for Washington

American Mailing Device Corporation

The Cutler Mail Chute

Mail Box—L. C. Smith Building Seattle, Wash., Gaggin & Gaggin, Architects, Syracuse, N. Y.

Pacific Coast Representatives:

San Francisco, Cal., THOMAS DAY COMPANY.

Portland, Ore. C. W. BOOST.

Seattle and Tacoma, Wash., D. E. FRYER & CO.

Spokane, Wash. E. C. TOUSLEY.

Cutler Mail Chute Co., ROCHESTER, N. Y.

Cutler Building.

BIGLEY'S

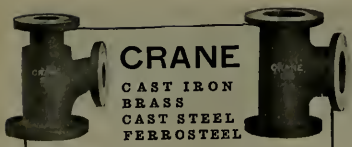
Curtains
Decorated Lamps
and Pottery
Fine Upholstered
and Period
Furniture

498 GEARY STREET
San Francisco, Cal.
Telephone: Franklin 5919

THE·L· SCHREIBER & SONS Co

ORNAMENTAL IRON & BRONZE
STRUCTURAL STEEL
CINCINNATI

SAN FRANCISCO
WESTERN BUILDERS SUPPLY CO
155 NEW MONTGOMERY ST.
LOS ANGELES
SWEETSER & BALDWIN SAFE CO
200 EAST 9TH ST



CRANE

CAST IRON
BRASS
CAST STEEL
FERROSTEEL

FLANGED FITTINGS

We have the largest line of patterns for flanged fittings for low pressure, standard, extra heavy, hydraulic, superheated and extreme hydraulic pressures, ranging in size from one-inch to sixty-inch, and for working pressures from fifty pounds to three thousand pounds.

The dimensions of the low pressure, standard and extra heavy fittings are in accordance with the 1915 *American Standard*.

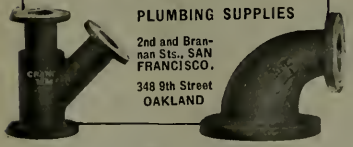
Castings for special fittings also may be made at a minimum expense owing to our large equipment of special patterns which may be altered at very low cost.

CRANE CO.

PLUMBING SUPPLIES

2nd and Brannan Sts., SAN FRANCISCO.

348 9th Street OAKLAND



H. E. BOTHIN, PRESIDENT
A. D. SHEPARD, VICE PRESIDENT
W. D. BUNKER, GENERAL MANAGER
R. B. GIRDWOOD, SECRETARY

JUDSON MANUFACTURING CO.

MANUFACTURERS OF
OPEN HEARTH STEEL
INGOTS, BARS, PLATES AND SMALL SHAPES

STRUCTURAL AND BRIDGE WORK
FOUNDRY, MACHINE AND PATTERN WORK
SHAFTING, BOLTS, SPIKES ETC

MAIN OFFICE AND SALESROOM
619-623 FOLSOM STREET
TELEPHONE, SUTTER 6620

OPEN HEARTH STEEL BARS

STRUCTURAL STEEL

Machine Work—Bolts—Castings
Pattern and Blacksmith Work

FERALUN
SAFETY TREADS

UNDERWRITERS' LABORATORIES, INC.
INSPECTED
ANTI-SLIP TREAD
FERALUN
AMERICAN ABRASIVE METALS CO.
NEW YORK

The ONLY efficient Safety Tread to bear the Underwriters' Label.

PACIFIC
BUILDING MATERIALS CO.
523 Market St. TELEPHONE KEARNY 3333 S. F.

FORUM BUILDING, SACRAMENTO, CAL.
R. A. Herold, Architect

The above is a Progress Picture of the Four Story addition to Sacramento's Largest Office Building, Now Completed.

STRUCTURAL STEEL FABRICATED AND ERECTED BY

The Palm Iron and Bridge Works
(Incorporated)
15th and R. Sts., Sacramento, Cal.

CALIFORNIA ARTISTIC METAL & WIRE CO.
J. T. McCORMICK, PRESIDENT
ORNAMENTAL IRON AND BRONZE
349-365 SEVENTH ST. SAN FRANCISCO

MORTENSON CONSTRUCTION CO.
CONTRACTORS FOR STRUCTURAL STEEL AND IRON
H. MORTENSON, Pres. CHAS. G. MORTENSON, Vice-Pres. and Mgr.
OFFICE AND SHOPS: CORNER 19TH AND INDIANA STREETS
PHONE: MISSION 6033 SAN FRANCISCO, CAL

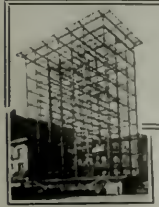
WEST COAST WIRE AND IRON WORKS
MANUFACTURERS OF
ARTISTIC BRONZE, IRON AND WIRE WORK
OF EVERY DESCRIPTION AND FINISH
861-863 HOWARD STREET SAN FRANCISCO, CAL.

FAIR MANUFACTURING COMPANY
J. FEY KERT, Proprietor
ORNAMENTAL AND MISCELLANEOUS IRON WORK
617 BRYANT STREET, SAN FRANCISCO Douglas 5122

THE GOLDEN GATE IRON WORKS
STRUCTURAL STEEL
1541-1549 HOWARD STREET, BETWEEN 11th AND 12th STREETS
Tel. Market 5445 San Francisco

Telephones Mission 139—Mission 59 A. A. Devoto, President
CENTRAL IRON WORKS, Inc.
STRUCTURAL STEEL
Office and Works: 621-651 Florida Street
Bet. Harrison and Bryant, 18th and 19th
SAN FRANCISCO, CAL.

ZOURI SAFETY STORE FRONT BARS
C. JORGENSEN & COMPANY
Phone Kearny 2386 Room 20 618 Mission St., San Francisco



SCHRADER IRON WORKS, Inc.
STRUCTURAL STEEL CONTRACTORS
Fire Escapes, Waterproof Trap Doors, Ornamental Iron Work
1247-1249 HARRISON STREET
Bet. 8th and 9th
SAN FRANCISCO, CAL.
Telephone Market 337

P. Noble, Pres.
E. B. Noble, Vice-Pres.
A. E. Wilkins, Sec'y

Beam, Angle, Channels, and Universal Mill Plates for immediate shipment from stock

Pacific Rolling Mill Co.

SUPPLIERS OF

FABRICATED STRUCTURAL STEEL, Forgings, Bolts, Rivets, Frogs, Switches, Cast Iron Castings

General Office and Works
17th and MISSISSIPPI STS., SAN FRANCISCO
Telephone Market 215

W. B. MORRIS, President H. M. WRIGHT, Vice-President L. J. GATES, Secretary

WESTERN IRON WORKS

STRUCTURAL IRON and STEEL CONTRACTORS

Gas Holders, Vault Linings, Jails, Fire Escapes, Beams, Channels, Angles and Steel Wheelbarrows Carried in Stock

Phones: Kearny 575
J 1259

141-147 BEALE STREET
132-148 MAIN STREET
SAN FRANCISCO, CAL.

TELEPHONE, MISSION 1763

C. J. HILLARD CO., Inc.

MANUFACTURERS OF

Bank and Office Railings. Elevator Enclosures and Cars.
Cast Iron Stairs and Store Fronts. Wire Work. Fire Escapes.

Nineteenth and Minnesota Sts.
Next to California Canneries

San Francisco, Cal.

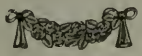
Structural Steel
Ornamental Iron
Ornamental Bronze
Prison Work
Vault Work
Metal Furniture
Filing Devices
Library Shelving
Stock Room Shelving
Steel Lockers
Electroliers

RALSTON IRON WORKS

INCORPORATED
TWENTIETH AND INDIANA STREETS
SAN FRANCISCO, CALIFORNIA
PHONE MISSION 5230

When writing to Advertisers please mention this magazine.

Antiquities, Artistic Ornaments for the Interior



A little expenditure adds to your Home Decorations the Grace of Genuineness and Rare Artistry.

A. FALVY

578-580 SUTTER STREET

Tel. Sutter 6939 SAN FRANCISCO

Architects designing hotels, apartment houses, theatres and office buildings, should keep in mind the fact that THREE BARRELS OF FUEL OIL burned by the

Fess System

will equal the heat produced by a TON OF COAL — *Economy for the Owner.*

And that the FESS SYSTEM is the Only Fire-Proof Rotary Burner manufactured — *More Economy for the Owner — Less Insurance to pay.*

Fess System Rotary Crude Oil Burners

FOR HEATING, POWER, COOKING

Office and Factory — 218 Natoma St., San Francisco

Branches — 1310 So. Hill St., Los Angeles; 428 Alder St., Portland, Ore.; 132 B St., San Diego.

Hipolito

EVEN TENSION

Window Screens Screen Doors

ROLLER SCREENS

For Casement Windows

METAL FRAME SCREENS

SEE DISPLAY AT

Building Material Exhibit

77 O'Farrell St. San Francisco

Simpson & Stewart

FACTORY DISTRIBUTORS

565 16th St., Oakland, Cal.

TELEPHONE LAKESIDE 415

MAY BE OPENED
AT THE TOP
FOR LIGHT
BETTER THAN
WINDOW SHADES
BURLINGTON
VENETIAN BLINDS
can be adjusted to *let in* light and air, yet *keep out* the sun and the gaze of outsiders.
For the home, school, bank and office building.
Look for the name Burlington and be assured of the best.
AND CLOSED
AT THE BOTTOM
FOR PRIVACY

Burlington Venetian Blind Co.

BURLINGTON VT. 365 MARKET ST., SAN FRANCISCO

Illinois Automatic Vacuum and Vapor Systems of Heating

Improved with graduated control. You can have much heat or little as conditions demand. Our Thermo Trap prevents any waste of heat and consequently saves fuel. Used in the biggest buildings and factories all over the United States and Canada.

We also manufacture a full line of Hughson, John Davis, Eclipse Pressure Reducing Valves and Back Pressure Valves, Oil Separators, etc.

"Twenty-five years of quality."

We carry a full line in San Francisco.

ILLINOIS ENGINEERING COMPANY

JAS. I. KRUEGER, *Representative*

559-561 Pacific Building, San Francisco

Telephone: Kearny 3047

A. S. MANGRUM, PRES. AND MGR.

MANGRUM & OTTER

(INCORPORATED)

TILING MANTELS GRATES

FURNACE AND STEAM HEATING

HOTEL AND KITCHEN OUTFITS

Stoves, Ranges, Refrigerators, Tin and Enameled Ware

Telephone, Kearny 3155

561-563 Mission St., San Francisco

JOHN A. HOOPER, Pres. FRANK P. HOOPER, Vice-Pres. A. W. HOOPER, Sec'y

Hooper Lumber Company

Wholesale and Retail Dealers in

OREGON PINE AND REDWOOD

17th and Illinois Sts., San Francisco

Car shipments to all Central California Points
Schooner shipments to Bay and River landings

Contractors' House Bills solicited
Phone Market 5313

OIL BURNERS
VACUUM PLANTS
ICE MACHINES

The Three Essentials for the Up-to-date HOTEL and APARTMENT HOUSE.

With a JARVIS Guarantee Your Troubles Are Over.

Home Manufacture—Everything but the motors

T. P. JARVIS MANUFACTURING COMPANY

Phone Market 3397

275 Connecticut Street, SAN FRANCISCO

GRAVEL

NILES SAND GRAVEL & ROCK CO.

GRAVEL BEDS AND PLANT, NILES, CALIFORNIA
MAIN OFFICE
MUTUAL BANK BUILDING
704 MARKET ST.
SAN FRANCISCO

TELEPHONE DOUGLAS 182

Crushed and screened concrete **Gravel and Rock.**
Sharp, clean **Concrete Sand, or Topping.** All from fresh water, thoroughly washed, and in any **size or mixture, with or without sand,** as desired.
Free from Salt.

A. F. EDWARDS, President
J. M. FABBRIS, Vice-President
J. A. MACKENZIE, Secretary
CHAS. F. EISELE, J. RUBIOLO } Asst. Managers

AMERICAN MARBLE & MOSAIC CO.

25-29 Columbia Square, San Francisco
Telephone Market 5070

Factory on Canal, South San Francisco Telephone South San Francisco 161

THE BITURINE COMPANY

Specializing in Protective Coatings for Iron and Steel

STRUCTURAL STEEL PAINT
INTERIOR TANK ENAMEL

Telephone Kearny 4478

24 CALIFORNIA STREET
SAN FRANCISCO

THE KINNEAR MFG. CO.
COLUMBUS, OHIO

STEEL ROLLING FIREPROOF DOORS AND SHUTTERS

Agents
Seattle - Portland - Los Angeles - Salt Lake City

San Francisco Office, 523 Market St. Tel. Kearny 3323

THE ARCHITECT & ENGINEER

VOL. LI. OF CALIFORNIA No. 3

CONTENTS FOR DECEMBER, 1917

Cover Design by Louis Christian Mullgardt

Frontispiece — Business Block for Messrs. Theo. H. Davies and Company, Ltd., Honolulu - - - - Page 38

LOUIS CHRISTIAN MULLGARDT, Architect

Recent Work of Louis Christian Mullgardt, F. A. I. A. - - - - - Page 39

By IRVING F. MORROW

Forty-three Halftone Plates

Editorial - - - - Page 104

With the Architects - - Page 107

INDEX TO ADVERTISEMENTS, PAGE EIGHT

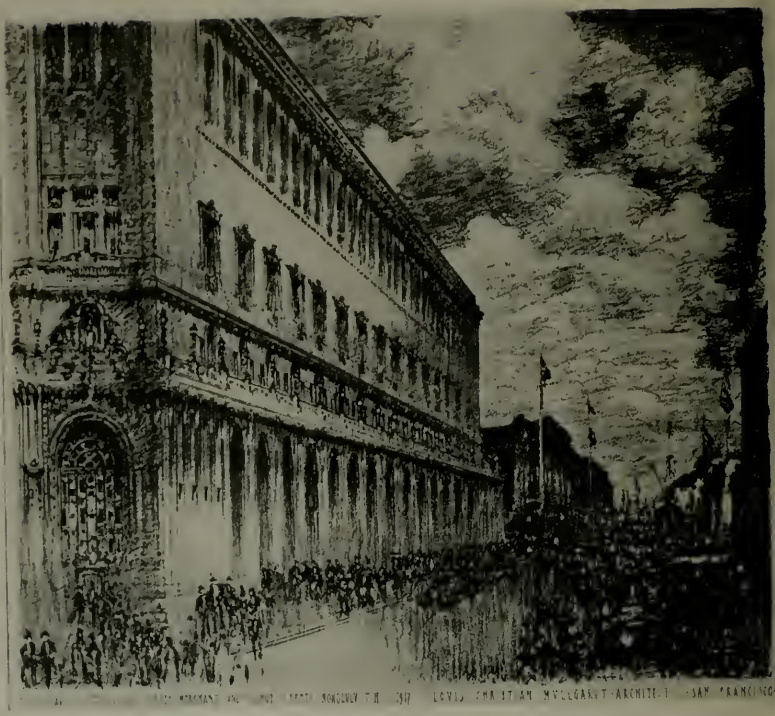
Published Monthly at 626-627 Foxcroft Building, San Francisco in the interest of

ARCHITECTS, STRUCTURAL ENGINEERS, CONTRACTORS AND THE ALLIED TRADES OF THE PACIFIC COAST

Yearly Subscription $1.50
Single Copy, This Issue, $1.00

Entered at San Francisco Post Office as Second Class Matter

Copyright 1917 by A. I. Whitney
All Rights Reserved



BUSINESS BLOCK FOR MESSRS. THEO. H. DAVIES AND COMPANY, LTD., HONOLULU

Frontispiece
The Architect and Engineer
of California
for December, 1917

THE
ARCHITECT
AND
ENGINEER
OF CALIFORNIA

DECEMBER, 1917 Vol. LI. Number 3.

Recent Work of Louis Christian Mullgardt, F. A. I. A.

By IRVING F. MORROW

I.

IN a scene of one of his lesser comedies, Molière represents a young girl gravely ill, visited by a number of physicians. Without investigation into her malady, which is in reality an acute case of lovesickness, one representative of the Faculty of Medicine maintains on purely empirical grounds that her life can be saved by bleeding alone, while another declares on equally empirical grounds that bleeding will be certain death, and only an emetic can prove effectual. With mutual recriminations they leave the room, while another of the physicians present explains to the distracted father that it is better a patient die in accordance with the authorized rules than recover in violation of them.

The analogy with the present state of architecture is suggestive. Both practitioners and spokesmen of the art are divided into antagonistic and mutually recriminatory schools, each appropriating the decorative apparatus of a particular period of the past, and stoutly maintaining that there is no salvation outside of its own chosen "style." Around these details, which are unessential, rages a contest waged with an acrimony worthy of a better cause, while composition, which is fundamental, stands

apart untroubled, beyond the field of discussion. A point of doctrine of all schools, which their several adherents often maintain with the most disconcerting courage of conviction, appears to be that it is better to make a poor composition in the correct style than to make the best composition in the world in an unauthorized style.

To those for whom salvation lies not in a cusp or a modillion and who are not intimidated by the mental labor exacted in adjusting old standards of judgment to new manifestations of principles, the architecture of Mr. Mullgardt comes as a welcome relief to a strained situation, if for no other reason than that, being assignable to none of the various contending schools, it can be used by none as propaganda. Yet detachment is purchased at the price of vigilance. Independence imposes the necessity of guarding against friends and foes alike, for it risks being equally misunderstood by each. It is perhaps unreasonable to expect that the large public should exhibit the mental poise which can apprehend principles and the mental flexibility which can apply them to varied cases. Subscription to a clearly formulated creed becomes a necessity, since it offers a guide to action and to judgment clothed with authority which needs no verification. But there are more things in heaven and earth than are dreamt of in our philosophies; and anything which contradicts or transcends the formulae of the creeds pays the penalty of being misjudged, if not condemned.

In addition to putting before the public an architecture which even the most benevolently intentioned public is unprepared to judge on its own merits, Mr. Mullgardt offers a direct affront to the purists, who are representatives of the vested interests of art. Whatever other sins of omission or commission may be charged to his account, with a gusto betraying an energetic enjoyment and with an admirable impartiality he flouts the established rules of all schools alike. Mediocre, even bad, architecture may be condoned, provided decorum remains unviolated; but open disrespect is the one offense which cannot be pardoned.

Thus it happens that the architectural non-conformist, with discrimination overborne by enthusiasm, cries out, Here is a man who makes a column not nine diameters high, a pediment which slopes not at the authorized angle, who uses bases and cornices and ornaments I can find in none of the books; he tramples time-worn rules and obsolete precedents; he possesses imagination and originality, and his architecture is a great step in the progress of the art.

The representative of the schools shows more restraint. He asks laconically, What style is it? knowing in advance that the only answer possible is None. The question is put with a complacent smacking of lips in anticipation of the confusion that should attend so amorphous a reply. Then he indulgently explains that this man presumes to employ motifs and details which can be found in none of the books, that he violates time-honored rules and established precedents, that his architecture has no firmer basis than his own imagination and originality, and is thus negligible in the development of the art.

It may be presumed that there were in the sixteenth century people who, intoxicated by the knotty exaggeration of joints and muscles in Michelangelo's painting and sculpture, proclaimed him a great artist; and others who, offended by his liberties with anatomy, pronounced him a mere mannerist; neither group of contestants ever backing off from the works far enough to see them whole and apprehend that important

principles of composition were involved to which these and similar matters of detail were subsidiary.

The truth is that the judgments which lead to such controversies are founded upon nothing more authoritative than the fortuitous sympathies and antipithies of personal taste, and bear as little relation to the underlying principles of art as the like or the dislike for oranges bears to the principles of botany. Few people possess a sufficient grasp upon abstractions to apprehend principles except in the concrete instances where they have been formulated into rules of practice. Yet rules are but special cases of principles. A rock substructure underlies and determines the nature of the earth's superficial conformations. It is visible only where it breaks the surface in isolated outcroppings; and even these occasional open evidences of the nature of the fundamental structure are liable to misinterpretation, save by the geologist of insight and training. To the ordinary observer architectural principles are visible only where they outcrop in a particular style. Thus are formulated rules which, whatever their validity in the case of their origin, are more than likely to be inapplicable under the altered circumstances of differing cases. While it is emphatically not true that a contempt for rules necessarily indicates an appreciation of principles, nevertheless it is unquestionable that the man with an insight into principles will without prejudice or preconception evaluate any rule at its real worth.

On two points at least both Mr. Mullgardt's admirers and detractors appear to agree. Both readily accord him imagination and originality; both assign by implication a similar meaning to these terms. Yet it must be obvious that his architecture cannot be both good and bad, and for the same reasons. A pause in passing at the point of divergence of these opposed estimates, and an effort toward an understanding of what imagination and originality really are, may not be without some value.

Imagination would appear to be identified as a free use of unusual details. This accords with the popular understanding of the word. Imagination is commonly attributed to whatever is exuberantly fantastic or vague and intangible; wherever confusion, unrest, or uncertainty must have prevailed in the mind of the artist; and works of art are regarded as imaginative in proportion to their departure from the real or from the familiar. Few people would question that the Cathedral of Rheims, or the portraits of Rembrandt exhibit imagination; but probably many would with reluctance admit the justification of the term if applied to the Parthenon, or to the portraits of Velasquez. The Gothic Cathedral and the Dutchman's paintings are felt to possess qualities of strangeness and aloofness from ordinary affairs, which entitle them to consideration as imaginative; while the Greek Temple and the paintings of the Spaniard seem to consist of elements too ordinary, and to produce effects too simple and unequivocal, to warrant the use of the term. Now it so happens that both the Cathedral of Rheims and Rembrandt's portraits are imaginative to an unusual degree. But they are so not because they contain something new and strange, but because in each case the artist proceeded with full assurance by deliberately considered means to predetermined ends. Imagination is none other than the power of forming images; and in proportion as the artist's vision has been distinct is the work entitled to be distinguished as imaginative. By this test are the Parthenon and Velasquez's portraits recognized as works of the highest imagination, because only by clear insight and steady vision could results

so incisive and authoritative have been achieved. And by the same test much art loosely classed as imaginative must be rejected as totally lacking in imagination because conceived and executed without certainty of intent. Novelty, strangeness or vagueness is not a necessary concomitant of imagination. But imagination is a fundamental necessity of all art; for achievement can proceed only from insight and understanding It is impertinence for a man who is uncertain as to his aim or as to the proper method of its realization to put forward any claim to attention.

To discuss originality here in its philosophical and esthetic bearings is neither possible nor necessary; a few examples will suffice to indicate the desired point of view.

Shakespeare, one of the most original geniuses of all time, gathered from known and recognized sources the elements of almost his entire output. He is not rated as the inferior of Ben Jonson because the latter largely invented the plots of his own plays; nor is the "Merry Wives of Windsor" regarded with any special esteem among the plays of Shakespeare because its plot appears to be unique in having been invented by the dramatist himself. The debts of Turner to Claude Lorraine and of Rodin to Michelangelo are palpable and avowed; yet both Turner and Rodin are outstanding figures for originality. Although from remote times the colonnade has been favored architectural material, there are probably few architects today who would neglect the opportunity to execute a monumental colonnade. But had Shakespeare only transcribed into dialogue his Holinshed, his Plutarch, or a novel of Greene, or had Turner copied pictures of Claude, or Rodin copied statues of Michelangelo, or were a modern architect to build a replica of Bernini's or of Perrault's colonnades, any one of these performances would be considered too stupid to deserve notice.

The use of the story of Electra and Orestes is interesting in this connection. The legend was well known when used by Aeschylus in the Libation Bearers. Sophocles later treated the same story in his Electra; and subsequently Euripides produced a similarly entitled play on the same subject. All of this occurred within the possible lifetime of a man; yet neither Aeschylus, Sophocles nor Euripides suffers the charge of lack of originality. Had the play of Aeschylus, however, opened the eyes of the ordinary Athenian to no new aspect of the legend, or had the plays of Sophocles and Euripides been no more than verbal paraphrases of the plays of their predecessors, they would have failed to receive the attention due to serious works of art. It is impossible to attempt here to trace subsequent appearances of the story through later times, down to its treatment in our own day in the opera by Richard Strauss. Suffice it to say that in all the discussion which has raged about his Electra no one has ever thought of condemning him for lack of originality because the subject treated was already well known. As for the final verdict of future generations on this opera, it will depend upon the degree to which it is felt that the composer has realized and expressed some hitherto unsuspected or unemphasized potentialities latent in the story.

On the other hand, the straining after novelty for its own sake has generally proved barren. Illustrations are less readily advanced from literature and painting because of the happy circumstance that in these arts whatever has failed to justify itself is readily put out of sight and forgotten, save by the antiquarian scholar. Architecture and sculpture are less fortunate, as will be attested by all who recall the excesses of

the Churrigueresque architecture in Spain, or of Baroque architecture and sculpture in Italy and Germany.

It is difficult to stop the multiplication of illustrations where pertinent ones are so numerous. Those which have been adduced, along with further examples which will spring to every mind, all enforce the conclusion that a work which possesses little or no novelty may be recognized as original, and that to a work of unquestioned novelty the neglect of laws of superior importance may prove fatal. Originality in the guise of novelty, the introduction of features for which an obvious precedent is lacking, is of no consequence to a serious work of art, either by way of enhancing or impairing its value. But the originality which is independence of vision is equally essential with the clearness of vision which has been defined as imagination. Words are all derived from the same dictionaries and facts from the same encyclopedias; but those who adopt other people's arrangements of words to repeat other people's ideas in regard to the facts perform a futile task.

Imagination—insight into the problem combined with a clear visualization of its solution; sincerity—the loyal pursuit of this vision, and the steadfast rejection of all effects which do not derive from and enforce the expression of a personally visualized solution; instinct for composition—the ability to manipulate in space the forms most proper for the expression of this solution—these are the qualities, intellectual, moral, and artistic, essential to the production of architecture considered as an art. These are exacting criteria; yet Mr. Mullgardt's architecture emerges successfully from a searching examination by their light.

Mr. Mullgardt possesses a mind relentlessly critical. No subject, however remote, is immune from the importuning of his Why? nor does any institution carry sufficient authority to be spared if an adequate answer is not forthcoming. But wherever he destroys he forthwith replaces with a creation of his own, bringing to the aid of this work of reconstitution an inexhaustible fertility of invention. This is the key to his work.

In solving his problems he brushes aside with impatience the incrustations of prejudice, and confronts each problem squarely on the basis of its own individual demands. The impressionists would claim him for their fold. The "innocence of the eye" of their painters before a new landscape is not more complete than what might by analogy be termed his "innocence of intellect" before a new program. Yet however unprecedented his solution, it betrays none of the uncertainty of tentative, but appears with a completeness as if guaranteed by the authority of tradition. Every work, from the large phases of the composition down to the minutiæ of the details, is pervaded by an entire consistency which could be achieved only by the most distinct visualization. This is a characteristic which no sensitive observer will have failed to note; but only a person who has enjoyed the privilege of working with Mr. Mullgardt can appreciate the full force of an imagination which permits the solution of problems mentally down to figures and details before pencil is touched to paper.

Mr. Mullgardt is a man without preconceptions. A preconception is a tacit suspicion lest ingenuity be wanting to envisage new situations on their own merits. Mr. Mullgardt's ingenuity is inexhaustible. Yet a facility of invention which might readily exaggerate into extravagance is tempered by intellectual integrity and the inhibition of taste. Every

composition expands obediently to one informing principle. No effect, however enticing, is allowed for a moment to distract his attention from this governing idea. With an unconcern almost ruthless he discards any feature the moment it becomes apparent that it is not serving the main purpose.

It may be well in this connection to correct a misconception which arises from the attempt to interpret Mr. Mullgardt's art by irrelevant standards. It is frequently assumed that he belongs to the Come-Let-Us-Be-Original-and-Create-a-New-Art School; that his innovation is purely wanton, and springs from a desire for difference at any price. The novelty of Mr. Mullgardt's work is in a sense a by-product of a conscientious consideration of the problem, rather than an end sought in itself. His mind tends to particularize rather than generalize. Because all problems vary, there must be variation in sensitive solutions. Innovation is not deliberate, but imposed by circumstances. He is at the opposite pole from the insincere poseur; originality is a condition of his sincerity.

Mr. Mullgardt's inventiveness is also averted from extravagance by an instinct for the significance of form, in its large aspects, its minor suggestions, and its most remote implications. Along with invention goes a power of selection and assimilation, transmuting as by a subtle alchemy the materials furnished by an active memory. There is a current impression that Mr. Mullgardt lives in proud ignorance of all past architecture, and conjures his own material out of the void. The opinion rests on no pretention on his part; it is due rather to the fact that his critics' observation is less keen and their knowledge and experience of smaller range than his own. His ignoring of the rules of the past does not result from ignorance of the achievements of the past. As a matter of fact, his memory is charged with a multitude of effects drawn from the most disparate sources. But an architectural motif in his mind is as it were disembodied, divested of the particular forms and details which accompanied its original manifestation. Thus completely assimilated, an idea may emerge expressed in forms so altered that only an analytic mind would divine its ultimate source.

Reference to serious standards reveals the inadequacy of making the peculiarities of what might be called Mr. Mullgardt's personal idiom the basis of a judgment of his work. To one mind his details will appeal with delightful piquancy; on one differently constituted they will produce a contrary effect. But irrespective of the bias of taste, every critical observer must appreciate that his work is of large significance, for, in addition to its being an achievement in personal creation noteworthy for vigor, poise, and consistency, it is firmly founded on, and eloquently exemplifies the fundamental principles of the art. Were one to seek a formula classifying Mr. Mullgardt in the fewest possible words, it might be said that he is an individualist of exceptional independence, fallen upon an era of almost negligible social authority. The combination is a perilous one, which would surely spell disaster for any but a strong man.

II.

That the showing of the following pages is not usual for an architect will be admitted by anyone conversant with current architectural journals. About a seventh of the illustrations consists of the usual photographs or working drawings. Of the remaining drawings, three-quarters

could readily find their way into any non-architectural exhibition of black and white art. Mr. Mullgardt's ability and facility as a draughtsman have received general recognition; but it will probably prove a surprise to note the quantity and the quality of the work in this collection, and to reflect that it is only a selection from the output of a comparatively recent period.

An architectural perspective, however well rendered, is ordinarily an obvious means to an end, and warrants consideration only in the light of its particular purpose. Mr. Mullgardt's drawings have the distinction of being independent works of art. Over and above serving their ostensible purpose of explaining a proposed structure, they court judgment and hold their own as examples of graphic art. Ruskin, who felt the fundamental unity of the arts beneath their apparent diversity, has written, "No person who is not a great sculptor or painter can be an architect. If he is not a painter or sculptor he can only be a builder." If this is true, it should be said, not, as is commonly done, that Mr. Mullgardt is "an artist as well as an architect," but that he is an Architect with a capital A.

The difference between Mr. Mullgardt's architectural drawings and those of the more familiar sort is not alone a difference in degree of draughting ability, but essentially a difference in aim and in point of view. The purpose of a perspective drawing being customarily to furnish the greatest possible detailed information in regard to the building, the artist begins by drawing the building at the largest size the paper will permit, and fills in the unoccupied triangles with appropriate "entourage." This is inadequate to Mr. Mullgardt's conception of composition. The inter-relation between a building and its surroundings is not casual, but fundamental. The conditions of the site become essential parts of the program in determining the composition; its contours, its outlooks, its approaches, its trees, its colors, all its permanent features, are mandatory provisions along with the number, size, and purpose of rooms, maximum cost, and like matters. In fact, to the true artist the conception of an architectural composition dissociated from site is as anomalous as Alice's perception of the grin dissociated from the Cheshire Cat. It is this spirit of the composition that Mr. Mullgardt endeavors primarily to convey in his drawings. He wishes not only to show that a building is horizontal or vertical, bold or delicate, and what are the relations of its elements, but why. This leads him to begin at the other end; he produces a sympathetic rendering of the characteristic phases of the landscape, into which the building is introduced in its true relation and at its proper value.

The non-architectural drawings in the present collection bespeak interests and aptitudes seldom found in the practicing architect. They make no claim for leniency of judgment, however, on the plea of coming from the hand of an "amateur artist." Their just observation of nature, their facile handling of media, their breadth and freedom of pictorial composition, challenge comparison with the work of our best pictorial draughtsmen.

In deference to Mr. Mullgardt's wishes as to presentation, the general composition of the Architect and Engineer has been materially altered in this issue. It is hoped that the wide departure in appearance is justified by the nature of the material illustrated.

BLOCK PLAN OF FOCAL POINT OF PROPOSED COMMERCIAL CENTER, HONOLULU

DURING a visit to Honolulu early in the present year, Mr. Mullgardt was called into conference with representatives of several of the city's leading financial and commercial organizations. The present plan for a Commercial Center was the result. It is characteristic of Mr. Mullgardt's optimism and breadth of vision that in his description of the project he refers to these buildings as merely constituting "the nucleus of the proposed new modern Commercial Center of the City of Honolulu."

The seven houses co-operating in this undertaking are the Charles Brewer Estate, Ltd., the Hawaiian Electric Company, Messrs. Castle & Cooke, Ltd., Messrs. Bishop & Company, Messrs. Theo. H. Davies & Company, Ltd., the First National Bank of Hawaii, and Messrs. M. McInerny Company, Ltd. (The property belonging respectively to each party may be identified on the plan by beginning at the west end on King street, and proceeding, in the order named, east on King street, down the west side of Bishop street to Queen street, and up the east side of Bishop street.)

The focal point of the scheme is the intersection of two of the city's main thoroughfares, Bishop and Merchant streets. Extension will be effected in all directions as the growth of industry determines. In the development under consideration Mr. Mullgardt's design controls both sides of Bishop street for a distance of two blocks, and the returns for varying distances on King, Merchant and Queen streets. The institutions occupying the four corners at the intersection of Bishop and Merchant streets have agreed to dedicate corner triangles to the formation of a plaza-like expansion at this point. A central monument is proposed at the intersection of the two street axes.

All parties to the improvement have agreed to the dedication of public passageways or walks at the lot lines. Thus blank interior walls will be avoided, and the interior rooms, instead of being poorly lighted and ventilated, will have adequate light and air, and at the same time be sheltered from the heat and the noise of the public streets. The public entrances with stairs and elevators will also be approached through these walks, leaving the street facades free for commercial purposes.

A comprehensive development such as this one is sure to win generous recognition for the vision and the skill of the architect in charge. It must not be forgotten that his activities are only made possible through the imagination, the foresight, and the public spirit of the business men who furnish his opportunity. Probably no city on this hemisphere has yet made it possible for a well qualified architect to develop, consistently and harmoniously so extensive a commercial area at its very heart.

MERCHANT
STREET
DISHOP
QUEEN
STREET

BANKING HOUSE FOR MESSRS. BISHOP & COMPANY, HONOLULU

AT the time of presenting the block plan and the seven perspectives here reproduced to his clients in Honolulu, Mr. Mullgardt wrote a short outline of the main features of the project to supplement and explain the drawings. The following excerpts from this statement may help to an understanding of the scheme:—

NEW COMMERCIAL CENTER FOR THE CITY OF HONOLULU.

"The Seven Business Buildings illustrated by accompanying preliminary designs constitute the nucleus of the proposed new modern Commercial Center in the City of Honolulu.

"Their architectural character will be in sympathy with the surrounding landscape, climatic conditions, customs and practical needs.

"Individual character of each structure is achieved without loss of unity.

"Exterior walls . . . to be . . . faced with enameled terra cotta in soft tones.

"Basements to be omitted except where necessary. Storage spaces and for other purposes are obtainable on upper floors with greater conveniences at less cost than in basements.

"First floor windows and doors to set flush with outside faces of walls where required. Glass enclosures to set back where required. Arcades and promenades to be established where required, and of widths to be determined. Arcades to be omitted where necessity demands, glass being substituted.

"Awnings constitute important elements in the designs both as essential and decorative features. Electric lights suspended within openings convert awnings into transparencies at night.

"Exterior illuminations will also provide for festal nights. Lamps are controllable in units and collectively. Lights within arcades will also illumine interiors after closing hours.

"Public walks do not require lamp posts at curb lines.

"Walks between structures provide natural ventilation, natural light and direct accessibility to entrances of structures. They preserve parity of values between parts not facing streets with parts facing streets.

"Public staircases and elevators will be approached by walks between structures. Street frontages are thereby preserved for commercial purposes.

"The designs contemplate structures which will be permanent.

"They will serve as lasting monuments to the commercial enterprise of the City of Honolulu."

TRANSPORTATION BUILDING AND OFFICE FOR MESSRS. CASTLE & COOKE, LTD., AND BUILDING FOR THE HAWAIIAN ELECTRIC COMPANY, HONOLULU

THE spirit of Honolulu, which Mr. Mullgardt has attempted to interpret in the present architecture, is set forth in words in the following statement written by him for publication in the Honolulu newspapers:—

"Honolulu is an acknowledged cosmopolitan world center. Her individuality is as distinct and definable as any one of the characterful world's concentration points.

"She ranks with Tokio, Pekin, Calcutta, Petrograd, Paris, Rome, London, New York, San Francisco.

"She is situated on the world's invisible line of travel, like an oasis in a great desert, and is less passable in travel than other cities of importance, which may be mentioned in the same category. Her phenomenal energy, growth, progress and value in exports surpass all normal apportionment.

"Honolulu is semi-tropical; the sun, abundant rains and rich soil throughout the Islands, constitute the foundation of Honolulu, the metropolis.

"She is modern and unique in character and variety of her inhabitants, pioneers, pilgrims and new settlers of many races, who inspire and direct her phenomenal enterprises, worthy educational institutions and other laudable causes, local, national and international. There is less provincialism in Honolulu than in the City of New York. She knows herself and all cities like New York, Paris, London and the rest, whereas their interest is centered and they are now content to know only themselves.

"Honolulu's character is in essence an epitomy of traditionally good Renaissance Europe and our lovable, kind, democratic country, the United States of North America; these are further blended with the benevolent atmosphere inherent in these Island peoples and the charming influence of the far east Orientals.

"Honolulu is new in that she is modern in thought, and intent. She is scientifically commercial and culturedly social. Her whole tendency is progressive,—without interference, she is destined to become a new world metropolis, as brilliant as Athens of old.

"Honolulu's architecture will constitute a new branch of splendor on the tree of the classical Renaissance. Her knowledge and keen perception make her understand the best of traditional precedent and the perpetual possibilities of modernization. The result must be a new and appropriate type of architecture, dignified and consistent. It shall breathe the greater, finer spirit of these Islands, and their intimate relationship to that which in precedent is best. It shall be essentially modern and vital, that it may be recognized the world over as the Architecture of the Mid-Pacific, the Hawaiian Renaissance style of Architecture, the spirit of the far west."

BANKING HOUSE AND OFFICE OF THE FIRST NATIONAL BANK OF HAWAII, AND BUSINESS BLOCK FOR MESSRS. M. McINERNY COMPANY, LTD., HONOLULU

THOSE who recall Mr. Mullgardt's Court of the Ages, or Court of Abundance, at the Panama-Pacific International Exposition, will note in the Hawaiian project a development of a motif and a spirit which there appeared in his work for the first time.

On the first story of all street frontages runs a monumental arcade. Higher stories, the number of which in each building is determined by the requirements of the particular case, step back from the plane of the arcade in the manner of a clerestory. Thus all structures, while free to meet and to express their several individual requirements, are obedient to the unifying influence of one dominant line and motif of composition. The arcades may be treated as open passages, or may be included within the floor area of the building, as circumstances dictate.

As a result of the arrangement of passageways between buildings, each building will be finished architecturally on all its sides.

BUSINESS BLOCKS FOR THE HAWAIIAN ELECTRIC COMPANY AND FOR THE CHARLES BREWER ESTATE, LTD., HONOLULU

PROMINENT as accessories in the Honolulu Commercial Center scheme are the original and varied arrangements of awnings which Mr. Mullgardt has devised. These are all arranged so that they may be opened or closed as desired, and so that in closing they do not become disfigurements to the architecture. The opportunity for the suggestion of Honolulu's semi-oriental situation and relations is unparalleled. It is proposed that the night street lighting be done from within these awnings, which then become transparencies for the mellowing and diffusion of the light. Lights are also contemplated behind the Arcade parapet, which will illumine with a graded light the upper facades of the buildings. As Mr. Mullgardt points out, street lights at the curb line become superfluous. The plan is rich in suggestions for festal occasions, both by day and by night.

EAST SIDE OF BISHOP STREET, LOOKING SOUTH FROM KING STREET, HONOLULU

THIS perspective shows the buildings of Messrs. M. McInerny Company, Ltd., the First National Bank of Hawaii, and Messrs. Theo. H. Davies & Company, Ltd. The frontispiece of this issue shows in particular the building for Messrs. Theo. H. Davies & Company, Ltd.

WEST SIDE OF BISHOP STREET, LOOKING SOUTH FROM KING STREET, HONOLULU

IN this drawing appear the buildings of the Hawaiian Electric Company, Messrs. Castle & Cooke, Ltd., and Messrs. Bishop & Company.

At the foot of Bishop street, several blocks distant, the Matson Navigation Company will establish its new pier, in consequence of which shipping traffic will be largely diverted to this locality.

At the intersection with Merchant street is shown the proposed monument, which will mark the focal point of the City's commercial life, and will express symbolically the history of the Islands and their unique position.

END OF SUBTERRANEAN TUBE CONNECTING EXTINCT CRATERS, HAWAII.

ON his first visit to the Hawaiian Islands Mr. Mullgardt made this and the five succeeding charcoal studies. The drawings were executed entirely in place, each at a single sitting. Several were accomplished under adverse conditions of intermittent rain.

Mr. Mullgardt's abilities as a draughtsman have never been displayed to greater advantage than in this series. Yet these sketches are but the by-products, as it were, of a trip crowded with active business.

CRATER OF VOLCANO KILAUEA, MAUNA KEA IN DISTANCE, HAWAII

THE following is a description in Mr. Mullgardt's own words of the subjects of these six Hawaiian drawings.

THE VOLCANO OF HAWAII

"Kilauea is said to be 'the greatest living volcano' in the world. It is situated on the Island of Hawaii. One generally goes first to Honolulu by large, comfortable ocean steamer, and subsequently makes an excursion to the volcano island to witness the marvelous phenomena.

"One thinks of the Hawaiian Islands as tropical or semi-tropical, where cocoanuts grow on trees and ukeleles, songs and bathers romp hand in hand on the beach at Waikiki. Especially during the winter months, are we lured by the thought that there will be nothing more trying than a succession of delightful warmish days and breezy moonlit nights; nothing to endure but occasional tropical rains and kona storms. To one's amazement the high tops of the Island of Hawaii reach an altitude which is normally 4,000 feet and over 13,000 feet at two points which are capped with snow almost continuously, and lots of it. When the visitor stands at the side of the great caldron of molten lava, Kilauea, elevation 4,000 feet, and the strong winds blow from the snow-capped Mauna Kea and Mauna Loa, nearly 14,000 feet high, the cause and effect are so big that they may be likened to a squeeze between the coal and ice trusts. It is almost always blowing a gale, chilled by the snowy areas and accelerated by the vortex of Kilauea.

TROPICAL ISLAND OF HAWAII, SHOWING VOLCANO MAUNA KEA

"The approach to Kilauea really begins at the port of Hilo, the metropolis of the Island of Hawaii, distance over 200 miles from Honolulu. The Island of Hawaii is by far the largest of the group, and therefore justly entitled to the maximum rainfall, varying from 50 to 400 cubic inches per annum.

"The distance from Hilo to Kilauea is about thirty miles over good roads in automobiles, which are plentiful in the Islands.

"The cultivatable lands nearest the coast line are largely converted into sugar plantations of enormous proportion. Between these one drives until a gradual transition into Fern-land takes place, where fern-trees and other tropical growth reach giant proportions and together form a jungle land destined to be converted into sugar plantations in time.

"This jungle-land extends to a clearly defined edge of that devastated area which surrounds the crater of Kilauea. It is a shattered territory probably six square miles in area, which consists of loose earth and rock near the outer perimeter. Occasionally deep pits of extinct craters more than 2,000 feet in diameter and over 800 feet deep are seen. These pits have precipitous sides, densely overgrown with scrub vegetation. Their level bottoms constitute the last vestige of chilled lava, forming barren wastes upon which seekers of fame construct their names of broken pieces of lava to be read from above."

DISTANT VIEW OF VORTEX OF VOLCANO OF KILAUEA, HAWAII

"At a distance of about two miles from Kilauea one sees a panorama, which reveals numerous gas and steam fissures over the great area surrounding the volcano, all paying tribute to and being carried rapidly by the gale which sweeps the giant mass of gas vapors from the vortex.

"On occasional calm days these fumes rise in a vertically straight shaft to a height of a mile or two; then the vortex drags the gas and steam vapors from all these subservient fissures to its mighty self. As it reaches its altitude, the top expands into a great globule like a giant wine glass, or other forms which are created by cloud elements with which it constantly battles and to which it ultimately becomes welded.

BENCHES OF VOLCANO KILAUEA, HAWAII

"The near area to the crater of Kilauea is incrusted with overlapping flows of irregular scales of granular lava of enormous proportion, which sound threateningly insecure and hollow underfoot and cut like emery.

"Daylight makes all volcanic elements and surroundings look black, brown, greenish-yellow and white. Desolation and threats to explode and destroy without a moment's warning, fill the air, to the uninitiated and sensitive, and create every conceivable thought and sensation to the new visitor, especially that of a desire to be there and away at the same time. Most visitors seem to be irresistibly impelled to resort to poetic exaltations after they have left the danger zone and reached the Great Book at the Volcano House, which every visitor inscribes."

CRATER OF VOLCANO KILAUEA, HAWAII

"After daylight has expended its spell over the scene through illuminating everything from without, including the great territory beyond, it fades magically into mystical twilight:—then Pele, the goddess of fire, indiscernibly illuminates this remnant of the world's original nebula, transforming the daylight blacks, grays, yellows, greens and whites into iridescent burnished gold masses edged with shores of incandescent fire. All things within the crater which were invisible by daylight are now clearly visible, and that which was clearly visible by daylight is now invisible."

JUVENILE COURT AND DETENTION HOME, SAN FRANCISCO.

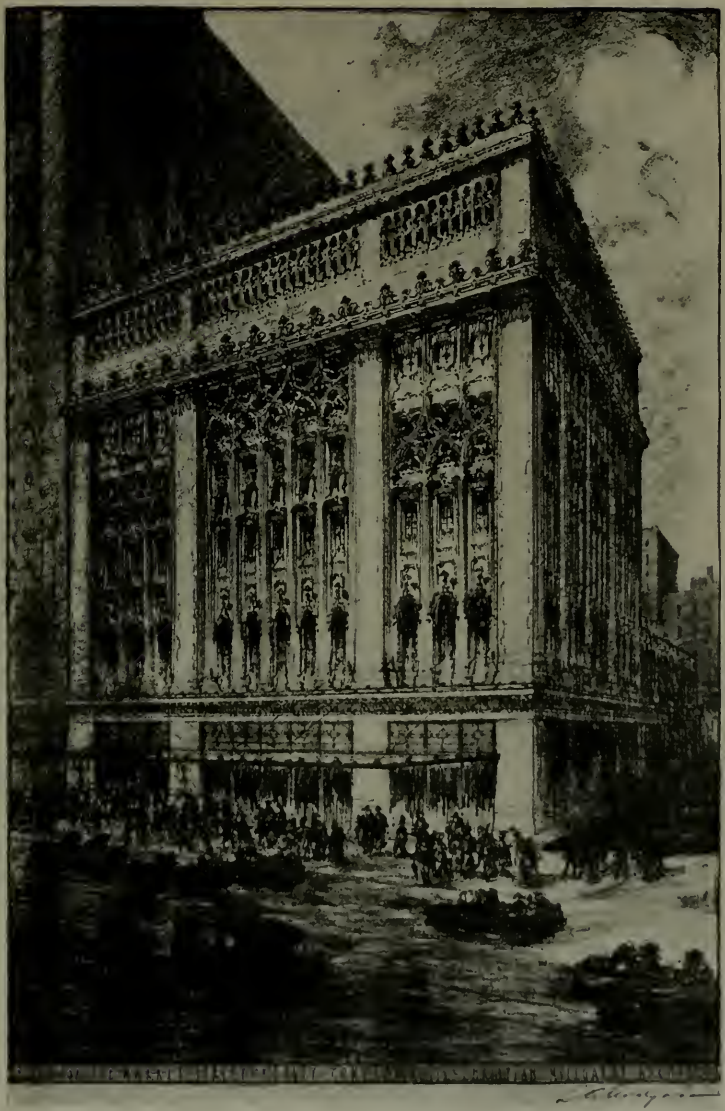
THE basic architectural idea in this building is the separation of departments by floors and the substitution of vertical for horizontal circulation. It is the same idea which was used in the City Hall at Oakland, California, and it has proved successful under the test of use in both instances. (It may not now be generally remembered that in the competition for the latter building Mr. Mullgardt's solution was the only design in addition to the winning one which introduced this principle.) By utilizing the advantages of modern elevator service it becomes easier and more rapid to traverse vertical distances in the car than horizontal ones on foot.

Each floor consists of a horizontal corridor from end to end with rooms on either side. The administrative offices and the Juvenile Court are located on the ground floor. Succeeding floors are devoted severally to the various classes of children to be handled, up to the top floor, which runs into the roof space, and is given over to such services as kitchen and laundry. Stairs and elevators are housed in two towers on the rear facade.

The building is of concrete construction and the surfaces are buff "travertine" plaster, of the color and finish made familiar by the San Francisco Exposition.

MARKET STREET THEATRE, SAN FRANCISCO.

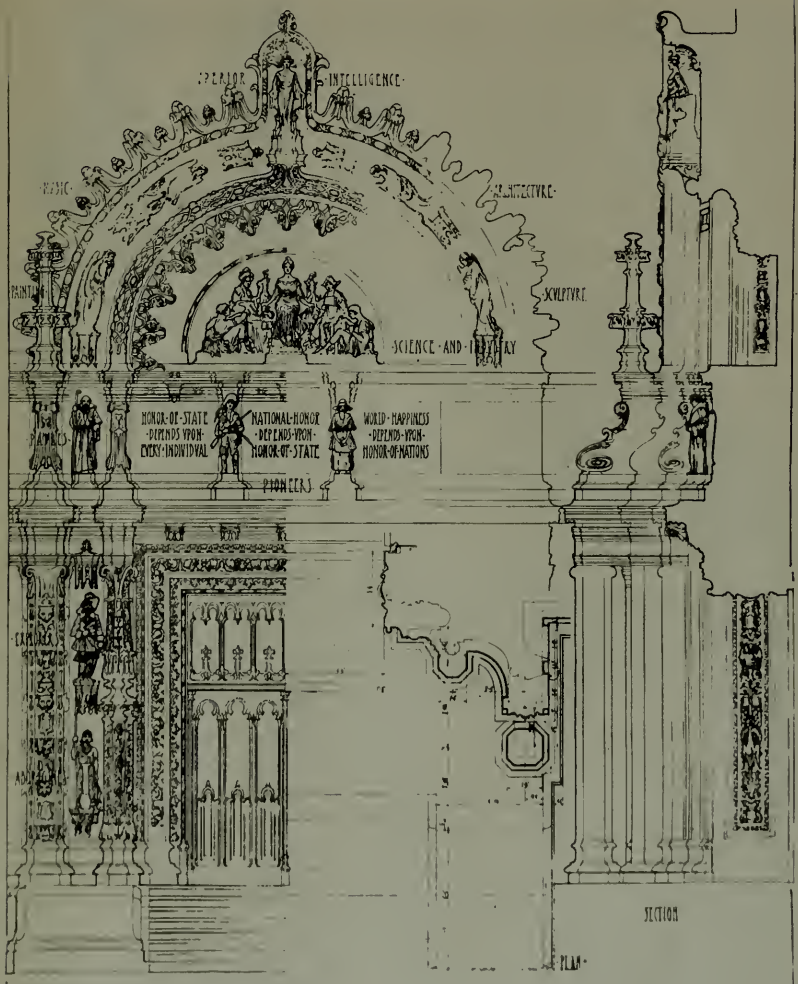
A COMBINATION of two difficult conditions had to be met in this design—the necessity for open areas on the ground floor frontages, surmounted by the blank facades above. The design is handled with conspicuous walls of a theatre auditorium which comes out to the street vigor.



MEMORIAL MUSEUM, GOLDEN GATE PARK, SAN FRANCISCO. DETAIL OF TOWER ENTRANCE.

THE new Memorial Museum presented to the citizens of San Francisco by Mr. M. H. de Young is now being built at the Music Concourse in Golden Gate Park. The design for the completed building is shown in the illustration which heads the first page of this article. The unit under actual construction is the square at the right of the tower, included within the last three bays of trees.

The drawing opposite is a detail of what will ultimately be the main entrance in the central tower.



ONE INCH SCALE DETAIL OF THE TOWER ENTRANCE OF THE MEMORIAL MUSEUM GOLDEN GATE PARK SAN FRANCISCO CALIFORNIA GIFT OF M H DE YOUNG 1916 LOUIS CHRISTIAN MULLGARDT ARCHITECT

ALL MODELS MUST BE MADE SUBJECT TO ARCHITECT'S APPROVAL

28

MEMORIAL MUSEUM, GOLDEN GATE PARK, SAN FRANCISCO. DETAIL OF ATTIC.

THE new Golden Gate Park Museum is being constructed of concrete, with plastered wall surfaces, and ornamental work of cast cement. The plaster of the walls is a soft buff pink, combed to an agreeable texture. The cast work is of similar color, slightly lighter in tone.

This work shows an interesting development of decorative ideas which Mr. Mullgardt first used in the Court of Ages, or Court of Abundance, at the Panama-Pacific International Exposition. While Mr. Mullgardt's facility with pencil is recognized, it is not generally known that he is equally at home in the handling of clay. Few people knew that at the Exposition considerable portions of his modeled ornament were from his own hand. He is also personally responsible for much of the modeling of detail of this building. The sculptural panels in the frieze are the work of Mr. Leo Lentelli, who also co-operated with Mr. Mullgardt in his work at the Exposition.

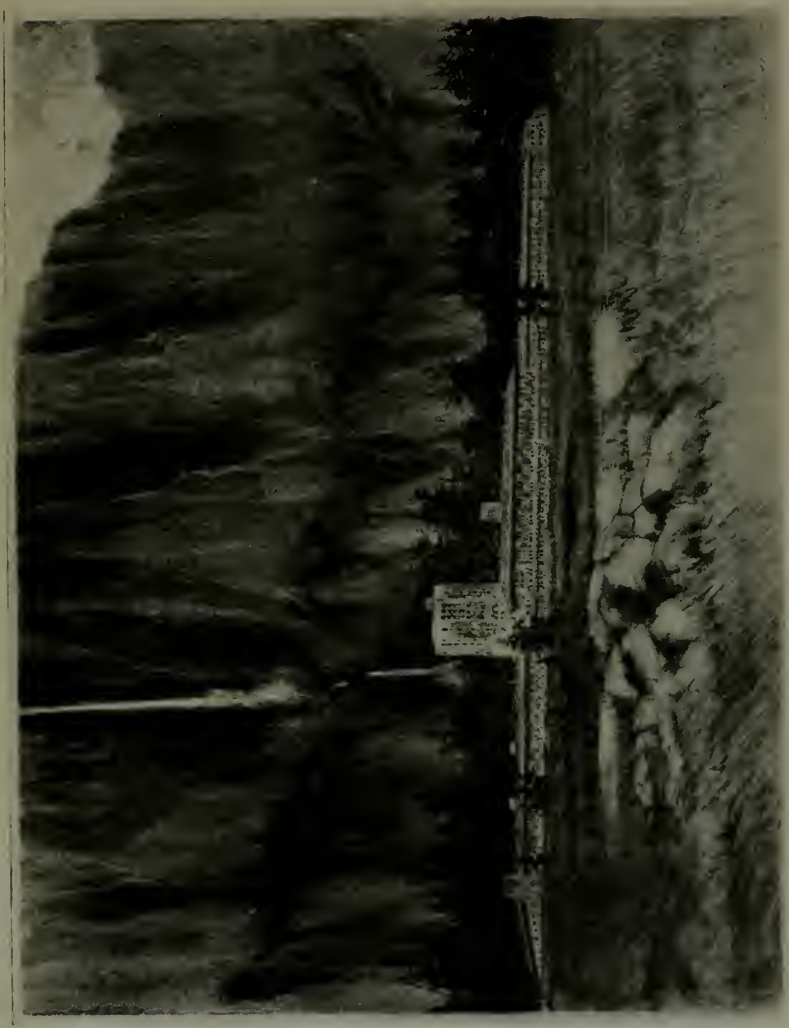
The photograph opposite was taken during construction.

HOTEL FOR YOSEMITE VALLEY. (DESIGN A.)

AS originally contemplated, the proposed hotel for Yosemite Valley was to have been an extensive building of stone construction, and was to have been accompanied by the development of commercial and social centers.

Mr. Mullgardt is invariably felicitous in the spotting of irregular masses. This design is also an instance of the intimate interplay between landscape and architecture which characterizes his composition. The passive horizontality of the building, in contrast with the tumultuous aspiration of the landscape, will be appreciated by anyone with a sympathetic understanding of our mountain scenery.

As a drawing this exhibits Mr. Mullgardt at his best. More than one painter has paid frequent visits to the Valley and covered much paper and canvas with paint, only to come away with less of its spirit and scale than is here suggested. The drawing is an interesting example of imaginative evocation; it was made in Mr. Mullgardt's office, without recourse to photographs or other documents.



HOTEL FOR YOSEMITE VALLEY. (DESIGN B.)

AFTER the completion of the original designs for the Yosemite Hotel, considerations of cost dictated a restriction in size and a change to plaster on frame construction. This design is thus a re-study of that shown on the preceding page.

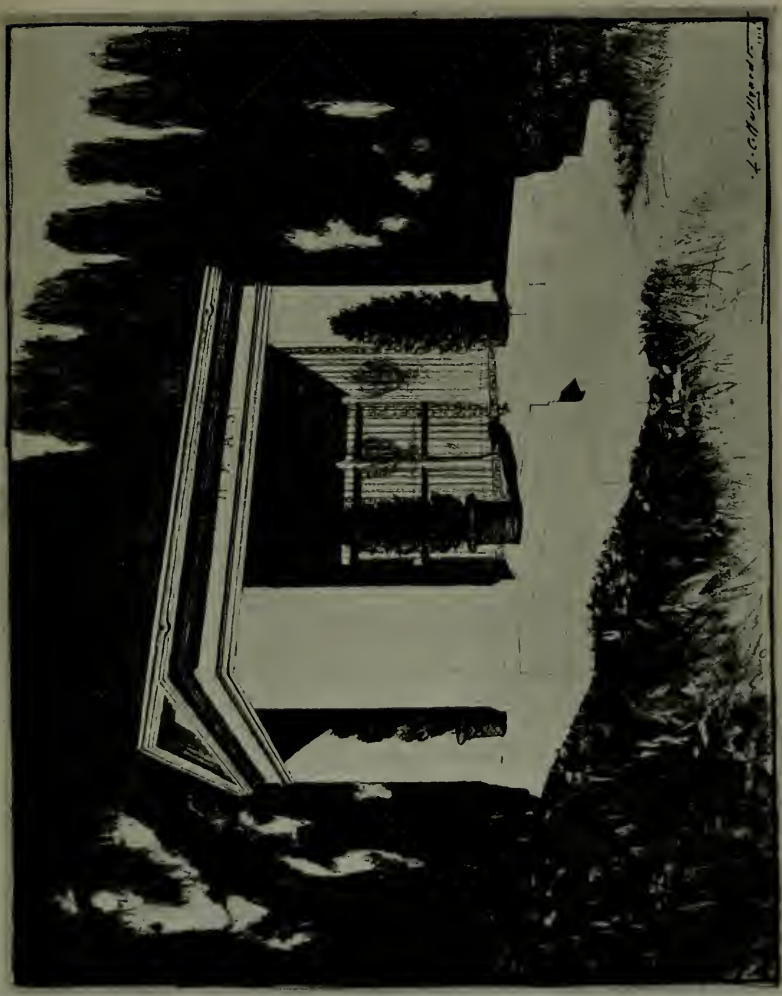
CHALET FOR YOSEMITE VALLEY.

This design is part of the extensive scheme of development projected for Yosemite Valley.

M. H. DE YOUNG FAMILY CHAPEL, HOLY CROSS CEMETERY, SAN MATEO COUNTY, CALIFORNIA.

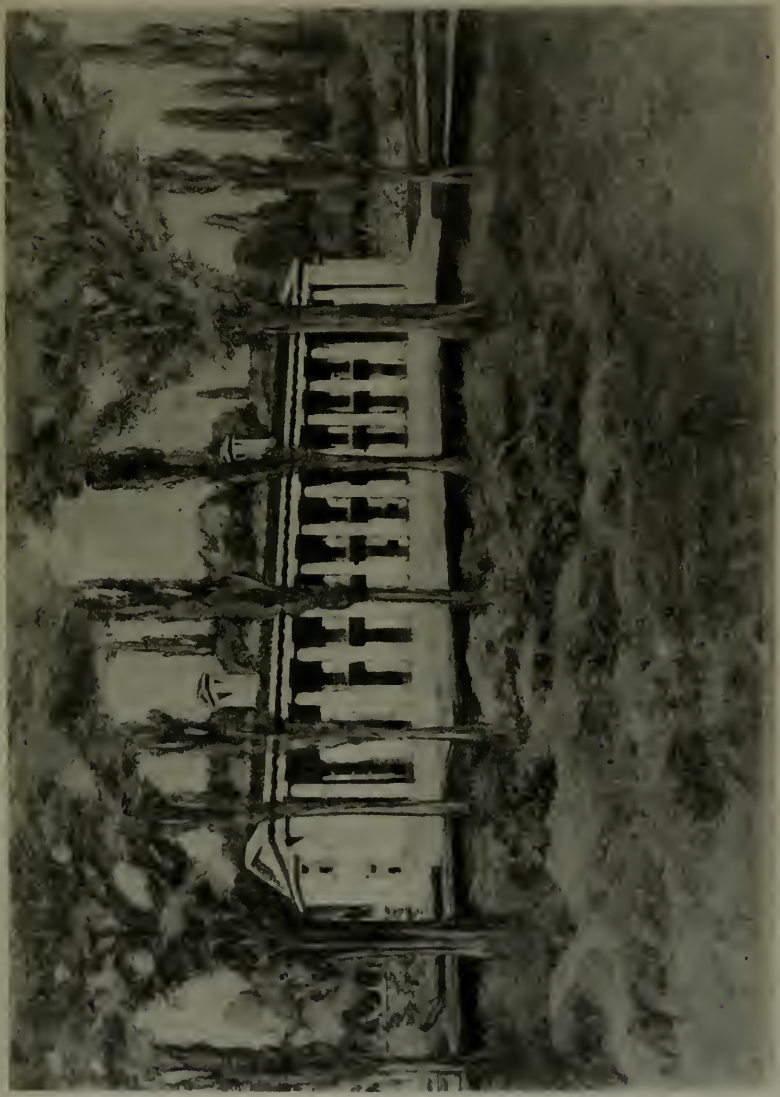
THE H. W. YOUNG FAMILY CHAPEL IN HOLY CROSS CEMETERY, CALIFORNIA · 1917 · · LOUIS CHRISTIAN MULLGARDT ARCHITECT

ABRAHAM HAAS FAMILY MAUSOLEUM, HOME OF PEACE CEMETERY, SAN MATEO COUNTY, CALIFORNIA.



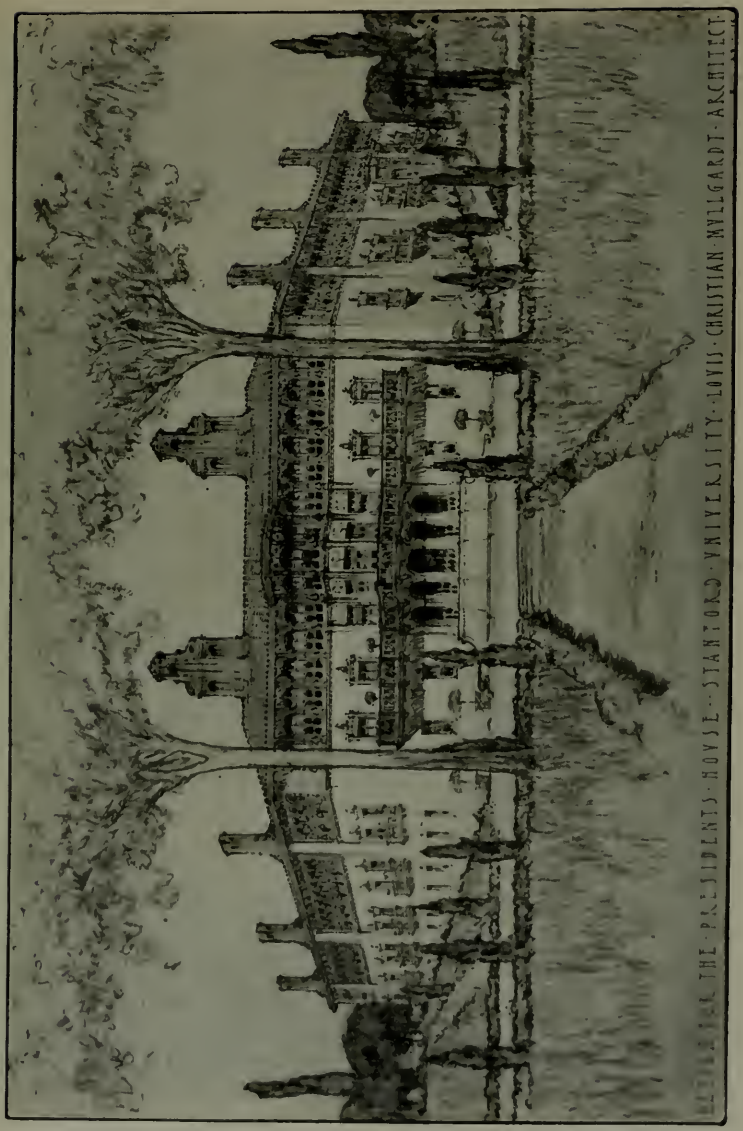
PRESIDENT'S HOUSE, STANFORD UNIVERSITY, PALO ALTO, CALIFORNIA. ORIGINAL DESIGN.

THIS first scheme for the President's House at Stanford University was never executed because the project was subsequently enlarged and the site changed. It remains one of the most simple, charming and dignified of Mr. Mullgardt's designs, and eloquently bears witness that a building may possess distinct individuality without superficial novelty. Its presentation is singularly harmonious and suggestive.



PRESIDENT'S HOUSE, STANFORD UNIVERSITY, PALO ALTO, CALIFORNIA. EXECUTED DESIGN.

THE site ultimately chosen for the President's House at Stanford University is the top of what is known as Lagunita Knoll, at the rear of, and overlooking, the entire University Campus. The ground falls easily in all directions. In plan the building is a U of which the arms diverge. It is of concrete construction, with plastered walls, and ornamental parts of cast cement stone. The plaster on wall surfaces is colored a pale buff pink and combed to a delicate texture. The cast work is similar in color and slightly lighter in tone.

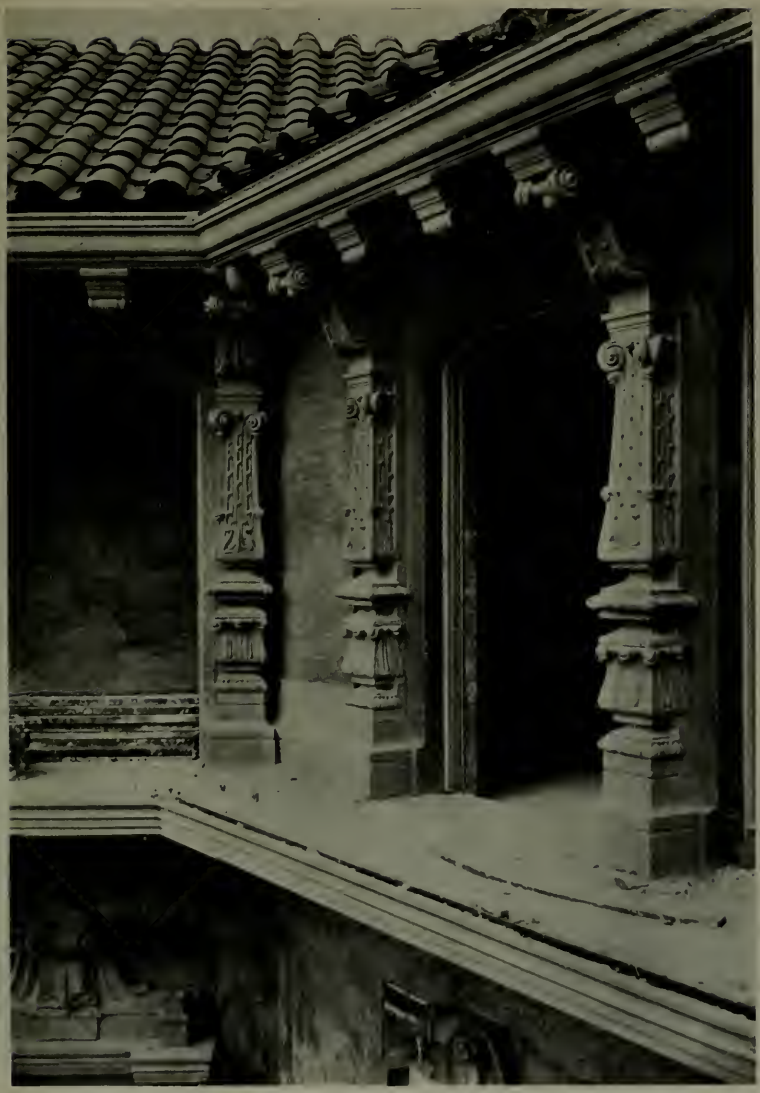

THE PRESIDENTS HOUSE STANFORD UNIVERSITY LOUIS CHRISTIAN MYLLARDT ARCHITECT

PRESIDENT'S HOUSE, STANFORD UNIVERSITY, PALO ALTO, CALIFORNIA. DETAIL OF ANGLE OF COURT, SECOND STORY.

ALTHOUGH this photograph and the one on the following page were taken during construction, they give a fairly complete idea of the nature of the detail.

The projecting balcony shelf will be closed in by a continuous metal rail of slender baluster design, Spanish in suggestion.

The combed texture of the plastered surfaces may be noted in the photographs.



PRESIDENT'S HOUSE, STANFORD UNIVERSITY, PALO ALTO, CALIFORNIA. DETAIL OF SECOND STORY.

(Refer to notes accompanying the preceding illustration.)

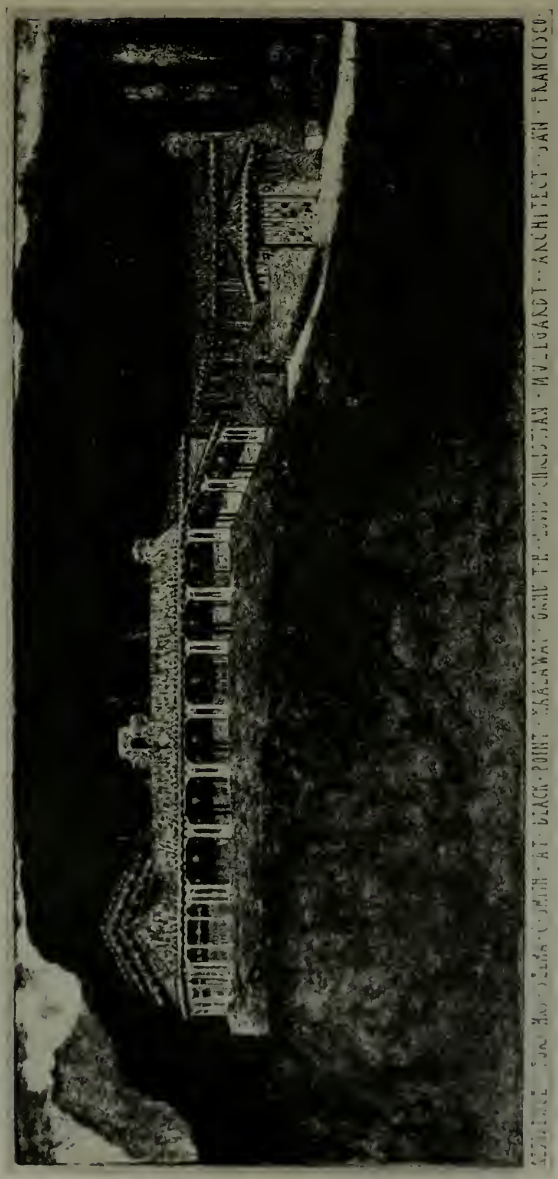
RESIDENCE FOR MR. AND MRS. HERBERT C. HOOVER, PALO ALTO, CALIFORNIA.

THE composition of this house is characteristic of Mr. Mullgardt's handling of irregular masses, and of his intimate sympathy with the California landscape.

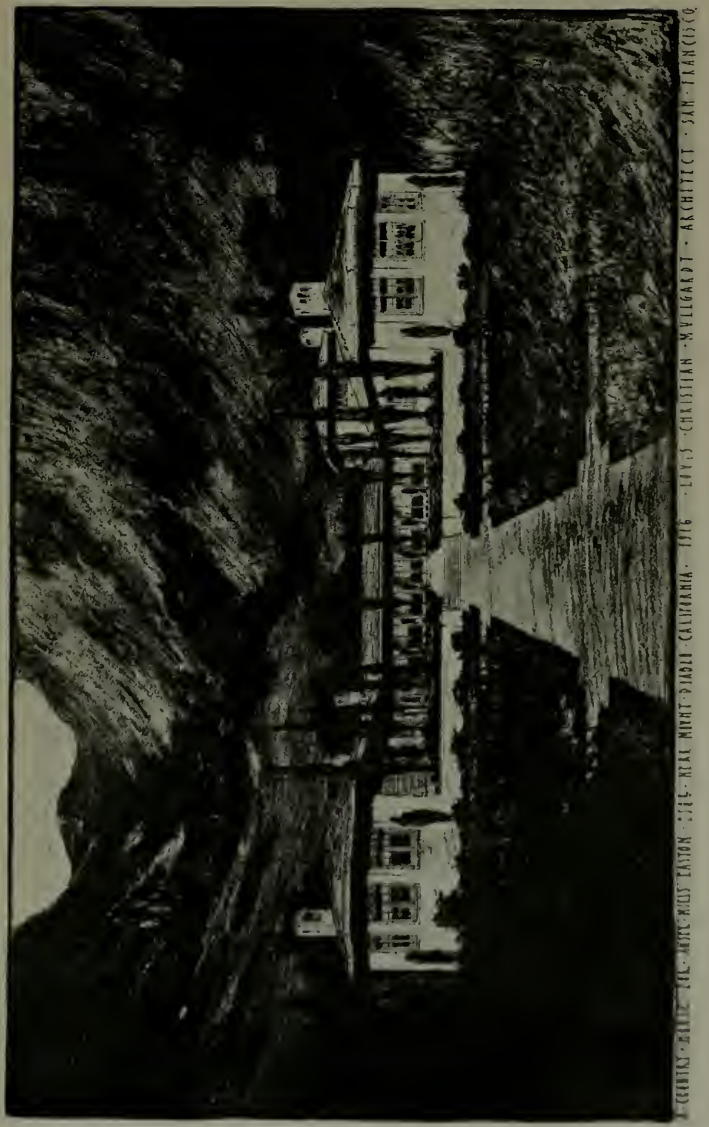
RESIDENCE FOR MRS. SELMA C SMITH AND DAUGHTERS, KAALAWAI, OAHU, T. H.

THE house stands on sloping ground on an eminence above the ocean, backed by mountains.

The walls of the building are to be built of local volcanic stone of a deep brown color, the roof of tile. It is the intention that the concrete columns of the loggias, along with wood cornices, etc., shall be painted in bright colors and heavily varnished, giving the appearance of oriental lacquer work.

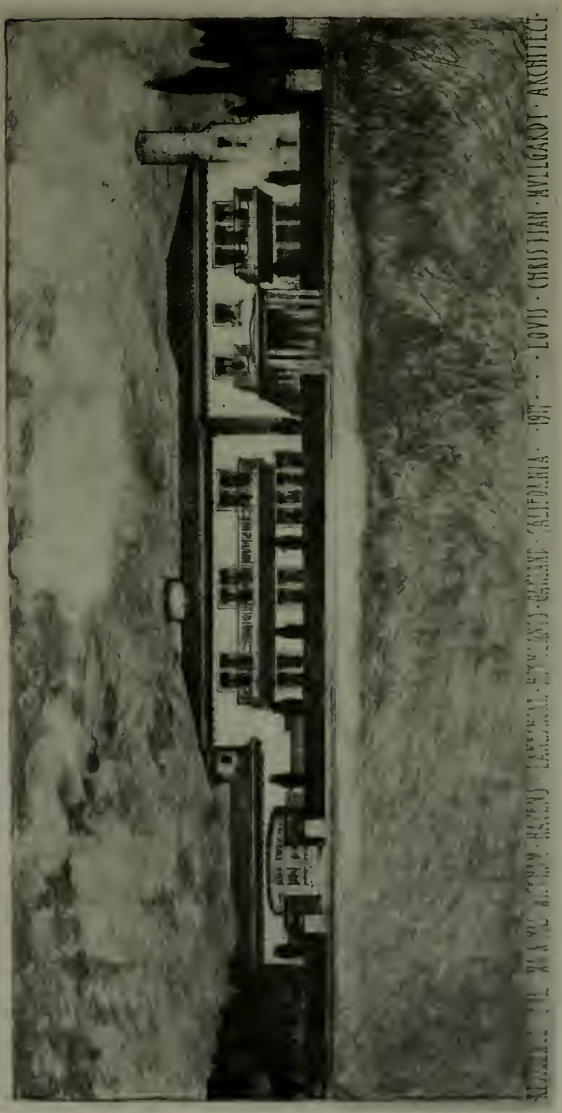


COUNTRY RESIDENCE FOR MR. AND MRS. ANSEL M. EASTON, DIABLO, CONTRA COSTA COUNTY, CALIFORNIA.

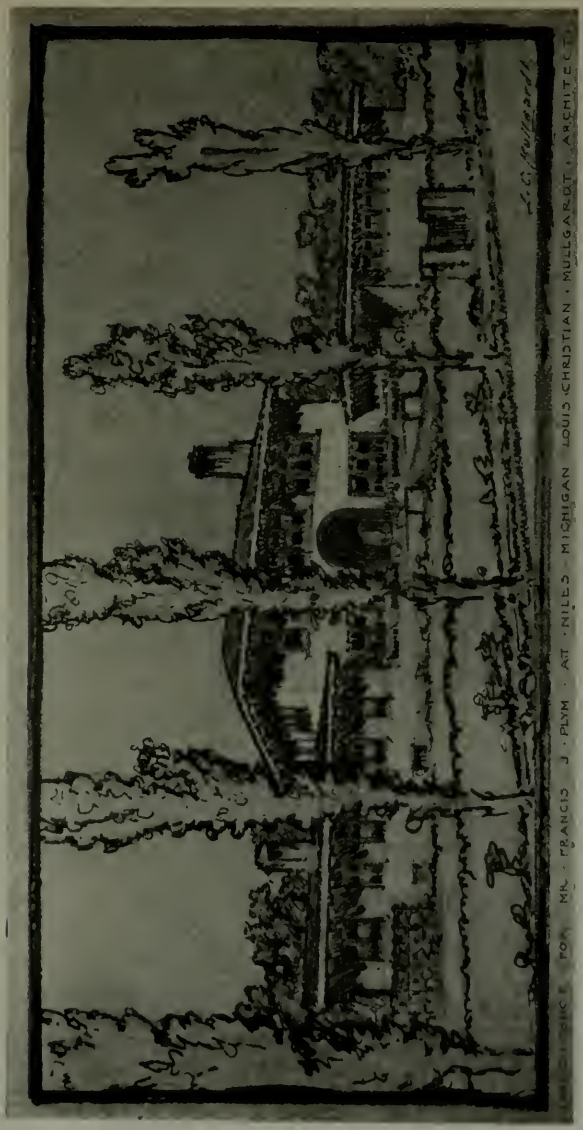


[illegible] · ANSEL-MILLS EASTON · [illegible] · NEAR MOUNT DIABLO · CALIFORNIA · 1916 · LOUIS · CHRISTIAN · MULLGARDT · ARCHITECT · SAN · FRANCISCO

RESIDENCE FOR MR. AND MRS. WICKHAM HAVENS, PIEDMONT, CALIFORNIA


LOUIS · CHRISTIAN · MULLGARDT · ARCHITECT ·

RESIDENCE FOR MR. AND MRS. FRANCIS J. PLYM, NILES, MICHIGAN


MR. FRANCIS J. PLYM · ART · NILES · MICHIGAN LOUIS CHRISTIAN · MULGARDT · ARCHITECT

COUNTRY RESIDENCE FOR DR. AND MRS. JARVIS, SEQUOIA CLUB, ALAMEDA COUNTY, CALIFORNIA.

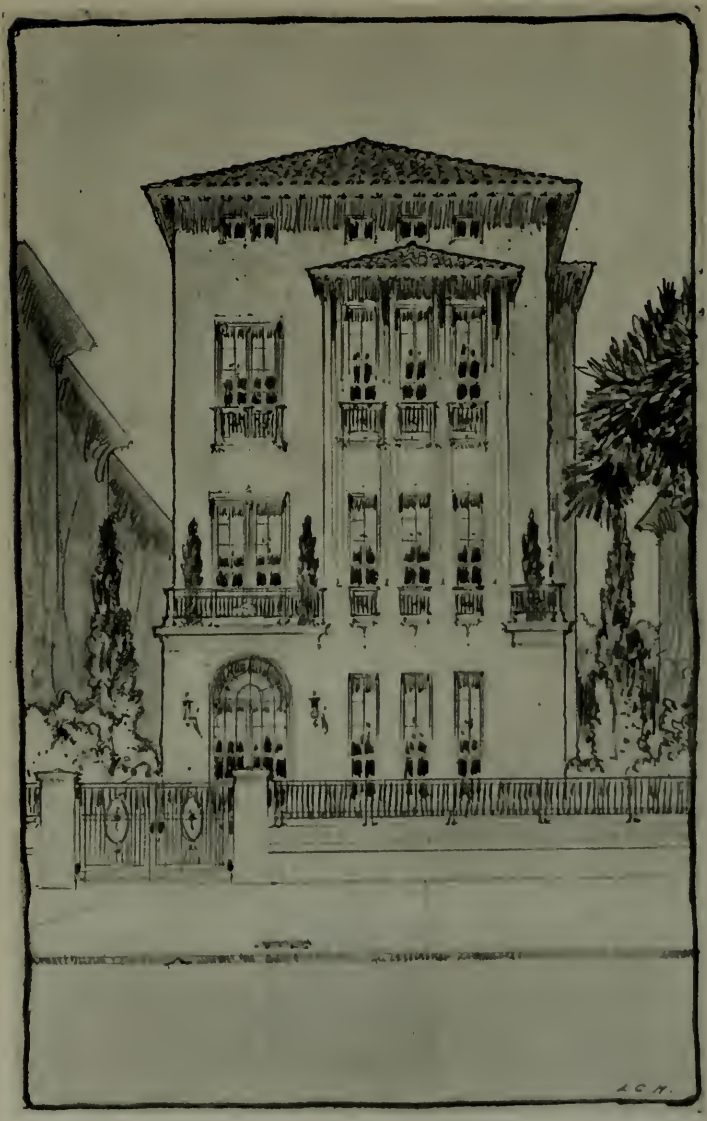
THIS drawing is of exceptional interest as an example both of Mr. Mullgardt's conception of architecture as a part of the landscape composition and of his ability to evoke the subtle spirit of a landscape in drawing. The dry, grassy slopes, the scattered scrub oaks and shrubbery of the hills, the distant clump of eucalyptus on the flat, all so characteristic of the landscape of Central California, are suggested with a delicacy and felicity of touch worthy of the work of the painter by profession.

PROPOSED REMODELING OF A CITY RESIDENCE. (DESIGN B.)

(Refer to note accompanying Proposed Remodeling of a City Residence, Design A.)

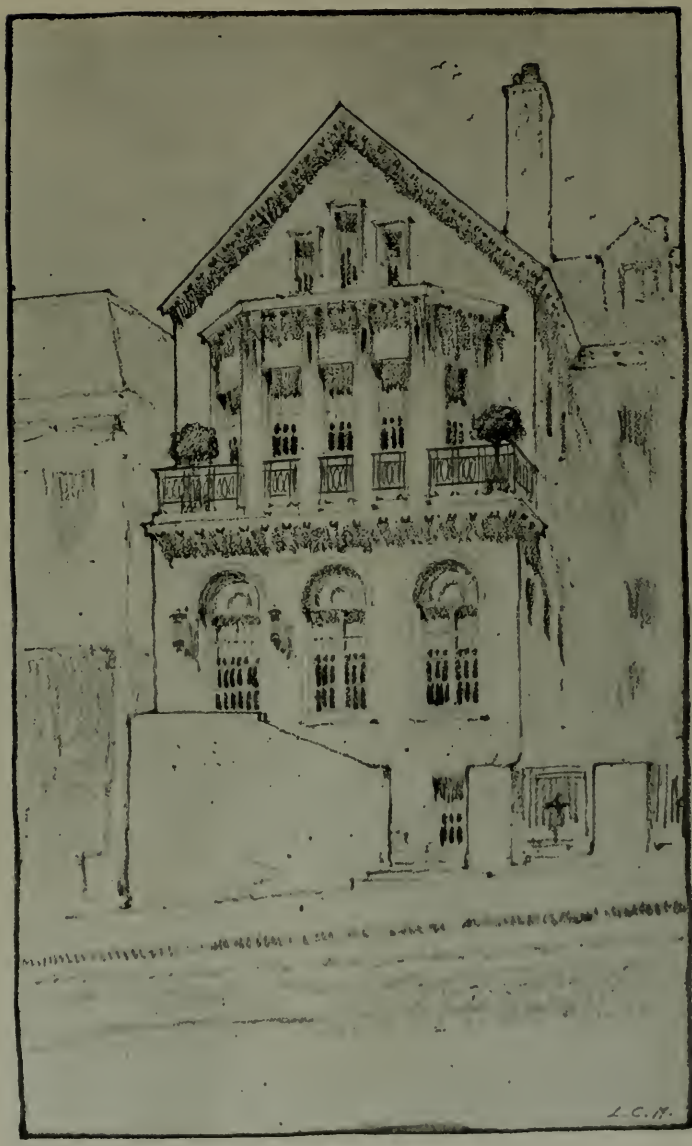
PROPOSED REMODELING OF A CITY RESIDENCE. (DESIGN C.)

(Refer to note accompanying Proposed Remodeling of a City Residence. Design A.)



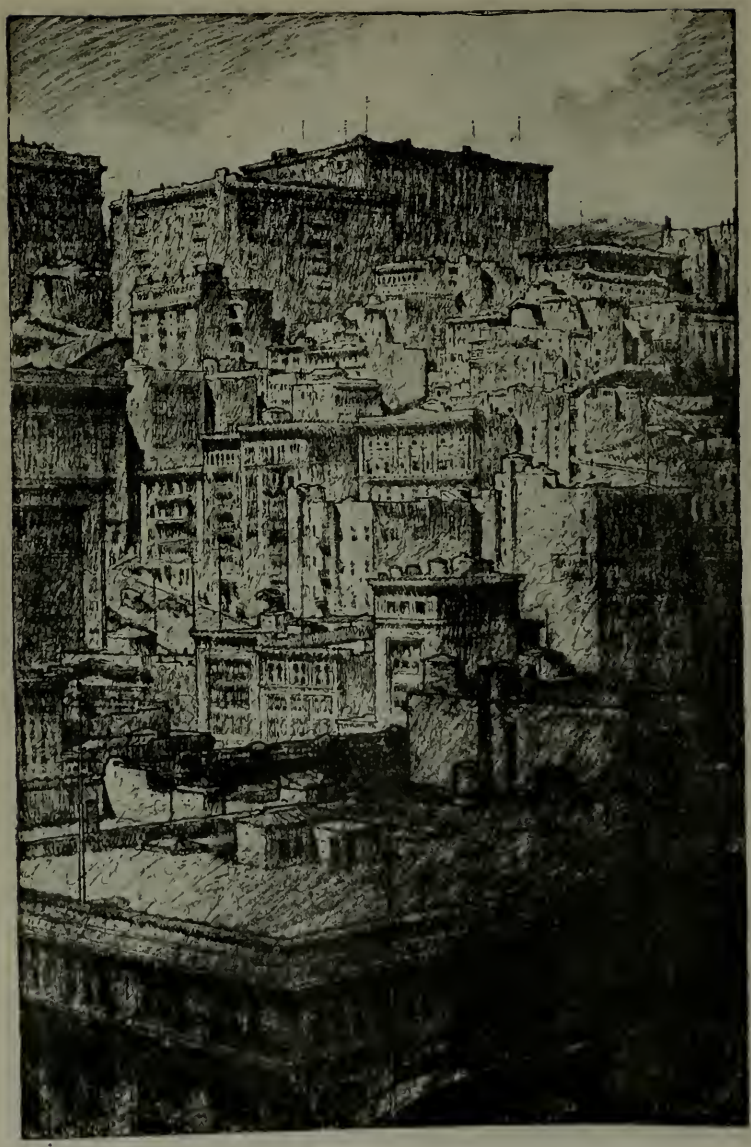
PROPOSED REMODELING OF A CITY RESIDENCE. (DESIGN D.)

(Refer to note accompanying Proposed Remodeling of a City Residence, Design A.)

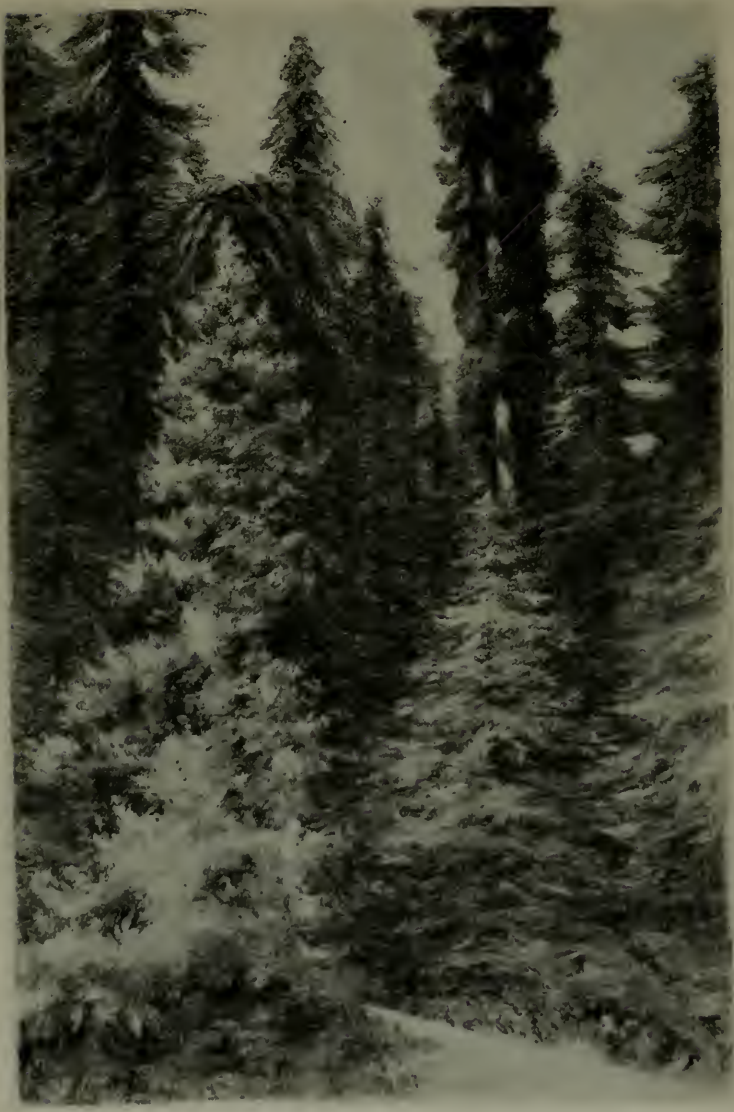

L.C.H.

VIEW OF NOB HILL, SAN FRANCISCO

MR. MULLGARDT'S offices on the top floor of the Chronicle building look out over the entire northern, eastern and western parts of San Francisco, the blue bay, and the hills and cities on its further shores. The present illustration was drawn looking from the draughting room window toward the Fairmont Hotel.



THE REDWOODS, BOHEMIA, CALIFORNIA



THE REDWOODS, BOHEMIA, CALIFORNIA

THE REDWOODS, BOHEMIA, CALIFORNIA

POSTER FOR THE BELGIAN RELIEF COMMITTEE.

BELGIVM'S-TOMORROW-MVST-DEPEND-VPON-OVR-TODAY

THE
Architect and Engineer
OF CALIFORNIA

Founded in 1905 by E. M. C. WHITNEY

A. I. WHITNEY - - - *Manager*
T. C. KIERULFF - - - *Legal Points*
FREDERICK W. JONES - - *Editor*

Published Monthly in the Interests of the Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast by the Architect and Engineer.

BUSINESS OFFICE AND EDITORIAL ROOMS
627-629 Foxcroft Building, San Francisco
Telephone Douglas 1828

The publishers disclaim any responsibility for statements made in the advertisements of this magazine

TERMS OF SUBSCRIPTION

(Including postage) to all parts of the United States $1.50 per annum; to Canada 50c additional; to all Foreign points $1 additional.

VOL. LI. DECEMBER, 1917 No. 3.

ASSOCIATE EDITORS

WM. B. GESTER, *Inspection and Tests*
O. P. SHELLEY, C. E., F. W. FITZPATRICK, *Fireproof Construction*
W. W. BREITE, C. E. - *Structural Steel*
ATHOL MCBEAN, HOWARD FROST, *Brick, Tile and Terra Cotta*
H. M. LOWENTHAL - *Roofs and Roofing*
FRED'K N. WOODS, JR., - *Rock and Gravel*
WILBUR DAVID COOK, *Landscape Architecture*
PAUL C. BUTTE - *Electrical Construction*
LOUIS G. MAUER - - *Waterproofing*
CHAS. H. CHENEY - - *City Planning and Book Reviews*
W. H. GEORGE - - *Reinforced Concrete*
T. R. BURKE - - *Sanitary Engineering*
J. W. FRICKE.. .. .. .. *School Equipment*

ARCHITECTURAL

Alfred F. Rosenheim	Edward M. Garden
Fred'k H. Meyer	Irving F. Morrow
August G. Headman	F. D. Hudson
Horace G. Simpson	Elmer Grey
G. Albert Lansburgh	Sumner P. Hunt
Herman Barth	Ernest Coxhead
Chas. S. Kaiser	Harrison Albright
Chas. Peter Weeks	John Parkinson
Octavius Morgan	A. W. Smith
J. C. Austin	William H. Weeks
Edwin J. Symmes	Chas. W. Dickey
W. H. Ratcliff, Jr.	Jas. W. Plachek
E. C. Hemmings	Carl Werner

CONTRIBUTORS

Kenneth MacDonald, Jr.	Nathaniel Blaisdell
Wm. L. Woollett	Willis Polk
Wm. Arthur Newman	Smith O'Brien
Wm. C. Hayes	C. H. White
John Bakewell, Jr.	B. J. S. Cahill
Clarence R. Ward	T. Paterson Ross
John Galen Howard	Alfred Kuhn
Louis C. Mullgardt	John Reid, Jr.
W. Garden Mitchell	Arthur Brown, Jr.
Harry E. Squier, C. E.	H. J. Brunnier, C. E.
	C. H. Snyder, C. E.

BUILDING MATERIALS WON'T BE ANY CHEAPER

Building construction of the country has reached such a point of stagnation that men interested in this line of work and those supplying materials are repeatedly asked the question, "What is the cause of the inactivity of builders?"

Many answers have been given, all of which are no doubt partially true, says Rock Products. The common belief, however, is that the present state of affairs can be traced to the action of the government in lowering the price of steel and coal. This act, which dealt a blow to inflated prices and which no one criticizes the Government for having taken, has led to the belief that a general drop in the prices of building materials can soon be expected.

The great need of building material people today is to convince retailers that present prices cannot be lowered. Plant equipment has doubled, trebled and, in some instances, quadrupled in cost; common labor is higher today than ever before in the history of the country, and skilled labor, because of its shortage, is in great demand and is being paid wages in many instances equal to more than the profits made by building material retailers. Plants in all parts of the country have been compelled to run with their full quota of workmen in order to operate a plant of, say, 20 cars capacity, when all they receive from the railroads is one or two cars a day. This naturally increases the cost of production of materials which are actually shipped.

Regardless of the present prices of materials, building should proceed. It is a well-known fact that in every large city and in all manufacturing communities more adequate housing facilities are needed. Especially is this true in industrial centers where ships, commodities and munitions needed by the Government and our allies are being made.

Phillip Hiss, New York architect and chairman of the sub-committee on housing of the Council of National Defense, recently stated that the short-

age of workmen's accommodations is so acute in many industrial centers that work on Government war contracts is being seriously hampered from lack of workmen, the latter being unable to secure houses for themselves and their families.

Moderate priced homes in the larger cities of the Pacific Coast are in great demand, particularly in Oakland. Persons who cannot afford to live in modern flats or residences are compelled to take quarters in structures which are often termed uninhabitable and which should be condemned by the various city fire, health or building commissions.

Money for the erection of structures has been found difficult to obtain in some markets, but is more free in others. Since the successful sale of the Liberty Loan Bonds, money has become a trifle easier, and builders contemplating construction work in the near future should obtain their loans now.

Conservatism to an offending degree has pervaded the ranks of builders. If it were based on facts, showing the reasonableness of retarding building construction, there would be little argument. But, this conservatism has resulted in many instances, and is bound to have the same effect in the future, of not only retarding building, but of stopping it altogether.

THE VALUE OF A NEW BUILDING TO A BANK

The value of new banking quarters was recently made the object of a nation-wide investigation. A questionnaire, touching on the following points, was sent to a list of financial institutions which had of late either erected new structures or materially improved their old banking quarters:

1. What, if any, is the advertising value of a new building or improved quarters?

2. Other things being equal, do you believe that the bank with the new building is the one most favored by depositors?

3. Have deposits increased or decreased since the occupancy of the new quarters?

4. Would you attribute all or any part of this increase, if any, to the attraction of the new quarters?

With but little variation, and only slight reservation, or exception, all of the banks from which an answer was received replied in the affirmative to each of the questions.

One bank considers its building as its "best advertisement for many years to come," and says that its value in this respect "cannot be estimated in dollars."

An officer of another institution says: "The advertising value of a new building or improved quarters is, in my opinion, very high. People like beauty, and an imposing banking room appeals to most for the reason that a bank is supposed to represent the accumulated wealth of its community. Cheap equipment indicates a poor or cheap bank in the eyes of many."

Deposits, as a matter of cold figures, have in most cases shown positive and important increases, judging from the answers to question three. While a number of those questioned merely replied that deposits had increased, others gave actual figures.

Deposits of one bank, for example, increased from $6,500,000 to $9,500,000 since the erection of a half-million dollar building. Another's deposits increased from $6,000,000 to $12,000,000. Still another reported an increase of $1,500,000 and another an increase of forty per cent.

It would be a fallacy to state that all of these increases were due to the new buildings. There were undoubtedly other factors; but all things being equal, the bank with attractive quarters and up-to-date modern equipment secures the most business.

Of course, it must be borne in mind that, to be successful, the preliminary planning of a banking room must receive competent consideration. In order to insure the greatest facility and economy of operation, it is necessary that the designer and builder have thorough knowledge of the routine procedure of the banking business. A bank building may be most impressive in appearance, yet possess faults of arrangement which will cause perma-

nent inconvenience and dissatisfaction to its occupants.

The result of the above investigation is fairly conclusive evidence that there is a real commercial value in properly housing a banking institution. Better facilities increase the loyalty of old customers and attract new accounts. They make for greater efficiency among employees and make pleasanter for customers their transactions with the bank. They increase public confidence in the soundness and strength of the institution. They make for increased profits, satisfied directors, well-pleased stockholders.

The obvious answer is: Build Now!

Book Review.

"PRACTICAL STRUCTURAL DESIGN," by Major Ernest McCullough. Published by U. P. C. Book Co., Inc., 241 W. 39th street, New York. Price, $2.50 postpaid.

McCullough's "Practical Structural Design" is designed as a reference work for engineers, architects and builders, and as a text book for draftsmen and technical students. It is especially adapted to the needs of the student and all technical terms have been reduced to their simplest forms.

The author, Major Ernest McCullough, U. S. R., is an authority on this subject, having had such extensive experience in building design and construction that he was selected by the War Department to go with the engineers detailed to handle the reconstruction work in France.

American Institute of Architects

(ORGANIZED 1857)

OFFICERS FOR 1916-17

PRESIDENT.....JOHN LAWRENCE MAURAN, St. Louis
FIRST VICE-PRESIDENT.....C. GRANT LA FARGE, New York
SECOND VICE-PRESIDENT....W. R. B. WILLCOX, Seattle, Wash.
SECRETARY....W. STANLEY PARKER, Boston, Mass.
TREASURER.....D. EVERETT WAID, New York

San Francisco Chapter

PRESIDENT.....JOHN BAKEWELL, JR.
VICE-PRESIDENT.....SYLVAIN SCHNAITTACHER
SECRETARY AND TREASURER.....MORRIS BRUCE
TRUSTEES.....CHAS. PETER WEEKS, AUGUST G. HEADMAN, SMITH O'BRIEN, W. C. HAYES

Southern California Chapter

PRESIDENT.....J. J. BACKUS
VICE-PRESIDENT.....H. M. PATTERSON
SECRETARY.....HENRY F. WITHEY
TREASURER.....AUGUST WACKERBARTH

Board of Directors

LYMAN FARWELL, PERCY A. EISEN, S. B. MARSTON

Portland, Ore., Chapter

PRESIDENT.....JOSEPH JACOBBERGER
VICE-PRESIDENT.....FOLGER JOHNSON
SECRETARY.....ALFRED H. SMITH
TREASURER.....FRED WEBBER
TRUSTEES.....MORRIS H. WHITEHOUSE, F. A. NARAMORE

Washington State Chapter

PRESIDENT.....CHARLES H. BEBB, Seattle
1ST VICE-PRES....DANIEL R. HUNTINGTON, Seattle
2D VICE-PRESIDENT.....GEORGE GOVE, Tacoma
3D VICE-PRESIDENT.....L. L. RAND, Spokane
SECRETARY.....JOSEPH S. COTE, Seattle
TREASURER.....ELLSWORTH STOREY, Seattle
COUNCIL.....JAMES STEPHEN, Seattle; JAMES H. SCHACK, Seattle; CHARLES H. ALDEN, Seattle

California State Board of Architecture

NORTHERN DISTRICT.

PRESIDENT.....EDGAR A. MATHEWS
SECRETARY-TREASURER....SYLVAIN SCHNAITTACHER

Members

JOHN BAKEWELL, JR., J. CATHER NEWSOM

SOUTHERN DISTRICT.

PRESIDENT.....JOHN P. KREMPEL
SECRETARY-TREASURER.....FRED H. ROEHRIG
MEMBERS.....OCTAVIUS MORGAN, SUMNER P. HUNT, WM. S. HEBBARD

San Francisco Architectural Club

OFFICERS FOR 1917

PRESIDENT.....CHAS. PETER WEEKS
VICE-PRESIDENT.....A. WILLIAMS
SECRETARY.....JOHN F. BEUTTLER
TREASURER.....WILLIAM HELM

San Francisco Society of Architects

PRESIDENT.....GEORGE W. KELHAM
VICE-PRESIDENT.....JOHN REID, JR.
SECRETARY-TREASURER.....WARREN CHARLES PERRY
DIRECTOR (1).....CHARLES PETER WEEKS
DIRECTOR (2).....ARTHUR BROWN, JR.

Engineers and Architects Association of Los Angeles

PRESIDENT.....A. H. KOEBIG, SR.
FIRST VICE-PRESIDENT.....A. S. BENT
SECOND VICE-PRESIDENT.....IRA J. FRANCIS

Directors

J. J. BACKUS, GEO. P. ROBINSON, ALBERT C. MARTIN, H. L. SMITH

Washington State Society of Architects

PRESIDENT.....A. WARREN GOULD
SECRETARY.....WM. J. JONES
TREASURER.....J. L. MCCAULEY
TRUSTEES.....HARRY H. JAMES, WM. J. JONES, ALFRED BREITUNG, J. L. MCCAULEY, G. F. ROWE

San Diego Architectural Association

PRESIDENT.....CHARLES CRESSEY
VICE-PRESIDENT.....W. TEMPLETON JOHNSON
SECRETARY.....ROBT. HALLEY, JR.
TREASURER.....G. A. HAUSSEN

San Joaquin Valley Ass'n of Architects

PRESIDENT.....W. J. WRIGHT
VICE-PRESIDENT.....E. B. BROWN
SECRETARY-TREASUREE.....FRANK V. MAYO

With the Architects

Building Reports and Personal Mention of Interest to the Profession

Personal

Messrs. Horace G. Simpson and Hart Wood, architects, 110 Sutter street, San Francisco, announce the termination of their association. Work now building by the former association will be completed by them. Mr. Wood and Mr. Simpson will continue practice independently, being located for the present at the above address.

Mr. R. A. Herold, architect, of Sacramento, has departed for the Orient and in his absence his office will be handled by Mr. J. E. Stanton, associate.

The architectural firm of Dickey & Donovan has been dissolved, Mr. Dickey taking offices in the Oakland Bank of Savings building, where he was formerly located, while Mr. Donovan remains in the Perry building, Oakland.

Mr. Mathew O'Brien, who has offices in the Foxcroft building, San Francisco, is spending the holidays in New York city, the guest of his brother, a prominent moving picture magnate.

Architects Join Fighting Forces.

Mr. Edward Burk, formerly in the office of Mr. Chas. Peter Weeks, the San Francisco architect, is with the aviation corps "somewhere in France." Prior to enlisting, Mr. Burk practiced architecture in Eureka, where he had built up an excellent clientele.

Mr. John Baur, formerly of the architectural firm of Paff & Baur and later associated with Mr. Loring P. Rixford, architect of San Francisco, has been appointed a captain in the U. S. aviation corps. The profession will lose a valuable man (we trust for a short time only), while Uncle San will be the gainer in more respects than one.

Mr. W. F. Herbert, an architect of Santa Rosa, has been commissioned a first lieutenant in the aviation section, Signal Officers Reserve corps. Mr. Herbert was formerly a sergeant in E Company, 159th Infantry.

Mr. David D. Myers, architect, has been appointed assistant professor of architecture at the University of Washington, Seattle. He will continue to practice his profession in that city. Mr. A. Warren Gould, architect, is head of the department. Mr. Myers succeeds Mr. Harold Sexsmith, who is now a first lieutenant in the University of Washington Ambulance Corps, at present in Allentown, Penn.

Mr. Walter Reed, Oakland architect, has been commissioned a member of General Pershing's staff for immediate duty on the French firing line.

Mr. Joseph M. Cahen, draftsman in the office of Mr. G. A. Lansburgh, is in training with Uncle Sam's fighters at American Lake.

Mr. Harvey E. Harris, formerly with Antonovich & Harris, architects at 20 Montgomery street, San Francisco, is now a captain in the Officers Reserve Corps in Oregon.

Mr. James T. Narbett of Richmond is expected to be called into the service any day. He was appointed an officer in the Reserve Corps some time ago. Mr. Narbett has just completed plans for a $60,000 brick school building to be erected at Bay Point, near Martinez, the first unit of which, consisting of three rooms, is to be built at once.

Mr. W. H. Weeks Busy

Plans are being prepared by Mr. W. H. Weeks, architect, 75 Post street, San Francisco, for a three-story and basement hotel at Fort Bragg, Mendocino county, for the Fort Bragg Hotel Company, Ltd. Building will contain fifty rooms and will cost $60,000.

Mr. Weeks is also preparing plans for the first unit of a group of high school buildings at Biggs, Butte county, for the Biggs Union High School District. Improvements will cost $60,000.

Designing County Hospital Group

Mr. E. C. Perry, Jr., 1625 Beverly place, Berkeley, has been commissioned to prepare plans for a group of county hospital buildings at Fairfield, Solano county, at an estimated cost of $85,000. There will be six buildings and they will be constructed either of hollow tile or reinforced concrete. Mr. Perry is also preparing plans for a county jail building to be erected at Vallejo at a cost of $35,000.

General Contractors File Protest

The San Francisco General Contractors Association has gone on record as opposed to the practice of some architects of calling for bids, both as a whole and segregated, at one time, and also the custom of providing for an unlimited number of alternate propositions. A recent example cited by the Association in a circular letter to the Institute Chapter is the method followed in taking bids for the Palo Alto High school, designed by Messrs. Allison & Allison, of Los Angeles. The Association feels that if owners and school boards, as well as architects, expect to have responsible contractors figure their work, the procedure of figuring should be carried out along more definite lines and in all cases the lowest responsible bidder should be given the contract.

Southwest Contractor of Los Angeles reported the protest as follows:

> Segregated bids on fifteen straight contracts and forty-nine additional alternate proposals on the Palo Alto high school were too much for the General Contractors' Association of San Francisco and they have broken forth in a protest in the form of resolutions which have been adopted and ordered sent to the San Francisco and Southern California chapters of the American Institute of Architects, the Palo Alto high school trustees and the state board of education. The association also condemns the action of the Palo Alto board in requiring contractors to deposit $25 to secure plans. The "alternate bid," particularly, is opposed by the contractors on the ground that it is unfair to the original low bidder because it opens the door to some other bidder whose individual "alternate bid" may look more attractive to the owner.

Fireproof Mercantile Building

Mr. Louis C. Mullgardt, Chronicle building, San Francisco, recently returned from Honolulu, where preliminary sketches were approved for a four-story and basement reinforced concrete wholesale mercantile building for the Theodore H. Davies Company, Ltd. The building is to cost $650,000, and will have concrete walls, hollow tile partitions, terra cotta exterior and metal trim throughout. The building will cover a ground area 200x300 feet. One of the problems which the architect is called upon to solve is the equipment of the entire building with a cooling plant, both for ventilation and water. There will be no heating system whatsoever in the building. The plans call for six passenger and freight elevators, two dumb waiters and five spiral conveyors. Actual construction will start early in the spring.

$500,000 Fresno Hotel

Mr. Chas. Teague and Mr. Fairfax Cosby, the latter an attorney in the Mills building, San Francisco, are the promoters of an eight-story fireproof tourist hotel to be erected at M and Tulare streets, Fresno, at an estimated cost of $500,000.

Shipbuilding Plant

Mr. Frederick H. Meyer, architect in the Bankers Investment building, San Francisco, is preparing plans for the Pacific Coast Shipbuilding Company's new plant to be built on Suisun bay, thirty miles from San Francisco. Construction is to be of the heavy timber type and the plans include the building of standard ways, slips, docks, foundries, machine shops and power plant. The buildings will probably cost $400,000 or more. Messrs. R. M. Burgess and Henry T. Scott are among the promoters of this enterprise.

Designing Model City

Mr. Bertram Goodhue of New York is transforming Tyrone, a "tin can" camp in the copper district, fifteen miles from Silver City in New Mexico, into a modern city for the Phelps-Dodge Company. A mercantile building, postoffice, bank, school, depot and an office building have been built, and a hotel, clubhouse, garage, theater and other improvements are contemplated. The city has been laid out in accordance with modern city planning ideas, a spacious park and wide streets with appropriate landscape gardening having been provided.

Leaves for War Duty

Mr. Lester H. Hibbard of the firm of Hibbard & Cody, has gone to Boston, Mass., to join the forces of the Stone & Webster Engineering Corporation, which has contracts with the United States government for the construction of warehouses, munition depots, hospitals, docks and railroads in France amounting to $100,000,000. Whether Mr. Hibbard will remain in Boston or go to France had not been determined when he left Los Angeles.

Oakland Architect Busy

Mr. Chas. W. McCall, Central Bank building, Oakland, has recently completed plans for a three-story warehouse to be built on 4th street, that city, for David Bercovich; a one-story concrete store building to be erected on 14th street, for Mr. A. H. Marks, and a $5000 frame and stucco residence in Alameda.

New Trustees of San Francisco Chapter, A. I. A.

San Francisco Chapter recently elected four new trustees, making an executive board of six members, instead of two as formerly. All are splendid men and capable members of the profession. They are Messrs. August S. Headman and Chas. Peter Weeks, who are to serve for three years, and Messrs. Smith O'Brien and W. C. Hayes, who are elected for two years.

Oakland Architect Has Much Work.

One of the busiest architects in Oakland is Mr. Clay N. Burrell, Albany block, who reports the following new work, all of which has been authorized by the owners:

One-story hollow-tile commercial garage, 154x130 feet, for the Grand Avenue Garage Company, to cost $22,000.

Store building for William Fry on Fourteenth street, to cost $8,000.

Three-story apartment house fronting on Lake Merritt, 100x215 feet, to cost $110,000.

One-story furniture store at Alcatraz and Adeline streets, Berkeley, for Kahn Bros., to cost $20,000.

Group of factory buildings for the Hammer-Bray Mfg. Company on Twenty-sixth avenue, to cost $25,000.

Apartment house at Fifteenth and Brush streets, Oakland, for Mr. R. J. Pavert, to cost $20,000.

Architects Given State Work

Mr. Edgar A. Mathews and Mr. Sylvain Schnaittacher, San Francisco architects, have been commissioned to assist Mr. George B. McDougall, state architect, in the preparation of plans for a $300,000 agricultural building to be built on the State Fair grounds, Sacramento. The structure will replace the one destroyed by fire two years ago. According to the Sacramento Bee, Mr. Mathews was selected by a resolution of the State Engineering Advisory Board. The architects working on the plans will be paid $12,500 for their services.

$10,000 Beach Hotel

Messrs. Falch & Knoll of San Francisco have plans practically completed for a frame and rustic hotel to be built at Willow Camp, Marin county, at an approximate cost of $10,000. The hotel will contain about fifteen guest rooms, with electric heating throughout. Outside the hotel will be tennis courts, showers, baths, dressing rooms and a number of tents for summer guests.

Improvements to Del Monte Race Course

Mr. Lewis P. Hobart, architect in the Crocker building, San Francisco, has made a report to the Monterey Jockey Club in regard to the cost of a new club house, grand stand, additional stables and ornamental iron entrance gates at the Del Monte track. It is estimated the improvements will cost $100,000.

Walker to Build Federal Bank.

Mr. P. J. Walker of the P. J. Walker Company, builders, with offices in the Monadnock building, San Francisco, has been appointed advisor and manager of construction of the new Federal Reserve Bank to be erected in San Francisco at a cost of $250,000.

Comparison of Building Material Prices

Bath tubs—1916, $15; 1917, $25.
Lavatories—1916, $8.50; 1917, $11.50.
Screens, copper wire—1916, 12½ cents square foot; 1917, 15 cents.
Wall beds—Small advance.
Store front construction—30 per cent increase.
Heating boilers—33 1-3 per cent increase.
Ironing boards—10 per cent increase.
Tile work—1916, 55 cents square foot; 1917, 75 cents.
Kitchen cabinets—1916, $53; 1917, $55.
Wood lath and plaster—1916, 26 cents square yard; 1917, 30 cents.
Metal lath and plaster—1916, 70 cents square yard; 1917, 85 cents.
Wallboard construction and plaster—1916, 65 cents square yard; 1917, 70 cents.
Grading and excavation (owing to increased cost of labor)—16 per cent increase.
Concrete ingredients—No advance.
Forms for concrete—Small advance.
Brickwork—Materials practically no advance, labor increase, 10 per cent.
Hardware (approximately)—85 per cent increase.
Roofing—Composition, 10 to 15 per cent increase; tile, no advance; tin, 40 to 50 per cent increase.
Plumbing goods—100 per cent increase.
Electrical work—100 to 125 per cent increase.
Metal lath and furring approximately 60 per cent higher than a year ago, although prices are being adjusted on a little lower scale at present.
Hardwood flooring (oak)—1916, $1.42 square yard; 1917, $1.50 square yard.
Hardwood lumber—Small advance.
Structural steel erected—1915, $75 per ton; 1916, $150; 1917, $100.

An Architect's Pledge

The president of the Michigan Society of Architects is meeting with a general affirmative response to the following pledge which he is circulating among members of the society:

"I hereby pledge myself to do all in my power in behalf of those architects who have entered the service of the United States, either directly or indirectly, in the present war.

"I further agree to take over the practice of any such architect, if requested, carry his work through for him in his name, accept no personal commission on his work, keep his name in evidence, paying all expenses incurred out of the payments accruing to him, and render a complete and careful accounting to him or his estate when all is finished.

"I further agree to protect his clientele and his reputation as carefully as if it were my own, and to do no work for his clients except in his name, until such time as he may return."

While the pledge serves to bring the matter before the profession in concrete form, its sentiment should be observed by every practitioner both in and out of the Institute.

Motion Pictures to Show Construction of Concrete Ships

Motion pictures will shortly appear showing a concrete ship now being built on the Pacific Coast (Redwood City).

A concrete ship over 300 feet long and of nearly 5000 tons capacity—no different from the ordinary steel ship except that while a steel ship of equal capacity would cost about $2,000,000, it is claimed that the concrete one will cost but $750,000. This concrete ship is being built after a manner not unlike that used in constructing reinforced concrete buildings. The ship will be launched early next year.

Another concrete ship has just been built in Montreal, and is now about ready for launching.

Deserves Support of All Architects

San Diego, Cal., Nov. 12, 1917.

The Architect and Engineer,
San Francisco, California.

Dear Sirs:—Kindly find enclosed money order as payment in full to date for subscription to your magazine, The Architect and Engineer. I desire to say that The Architect and Engineer is a splendid publication, and deserves the support of all architects engaged in the practice of designing modern buildings. It is splendidly gotten up in every way and a credit to its publishers.

Very truly yours,
EDWIN M. CAPPS, C. E.

$75,000 Country Home

Mr. George H. Howard, of the architectural firm of Howard, Maybeck & White, San Francisco, is completing plans for a two-story and basement country residence and garage to be built at Hillsborough, San Mateo county, for Mr. Walter S. Martin. The house, which is designed in the Italian school, is estimated to cost $75,000.

To Alter California Street Building

Messrs. Falch & Knoll, Hearst building, San Francisco, are preparing plans for alterations to a two-story brick building on California street, between Front and Davis streets, San Francisco, the property of Mr. Walter H. Sullivan.

Sacramento Theatre Alterations

Mr. James Seadler, Elks building, Sacramento, is preparing plans for extensive alterations to a moving picture theatre on "K" street, near 6th, Sacramento, owned by the Breuner Estate. Improvements will cost $15,000.

Alameda Theatre

Mr. George F. King, Berkeley architect, has prepared plans for a Class "C" theatre of 1500 persons capacity for Mr. James Hamblen. Construction has already started, the site being on Park street, near Encinal avenue. The building is to cost $75,000.

Pioneer Builder Dead

Mr. Jeremiah Mahoney, one of the best-known builders of the West and a resident of San Francisco since 1858, died at his home, 560 Page street, San Francisco, December 5th. He was 82 years old and had been ill but a short time.

Mr. Mahoney was a member of the firm of Mahoney Brothers, which constructed some of San Francisco's finest buildings, including the St. Francis and Palace hotels, the Flood residence, the Bank of California, and the Crocker, Phelan, Hearst and Flood buildings.

Now It's Concrete Planks

Stories of new ways of using concrete are seen frequently in news dispatches. The newest appears to be concrete planks and joists to be used in the same way as board planks and wood joists.

Not long ago Mr. Thomas Edison proposed the building of houses of concrete by the pouring method, using standard moulds. Now it is argued that moulding concrete into planks and joists is still cheaper. The planks are reinforced with steel wire and the joists with steel bars. Projecting bars are used to lock the parts together instead of nails.

Sacramento Warehouse

Mr. Washington J. Miller, Lachman building, San Francisco, is preparing plans for a four-story reinforced concrete warehouse to be built at Twelfth and "B" streets, in the capital city, for Joseph H. Herspring & Company. Building will be 30x160 feet and will cost $100,000.

Many Concrete Bridges Planned

Messrs. Weeks & Day, Phelan building, San Francisco, have completed plans for a number of bridges to be built on the state highway in Tehama county. All will be of reinforced concrete and will represent an expenditure of $250,000.

Forest Hill Residence

Messrs. Heiman-Schwartz, 212 Stockton street, San Francisco, have prepared plans for a frame and stucco residence and garage to be built at Forest Hill, San Francisco, for Mr. A. B. Hammond, lumber man.

$20,000 San Jose Home

Mr. Chas. S. McKenzie, architect of San Jose, has completed plans for a large two-story residence and garage to be built in the garden city for Mr. J. Bisceglia, at a cost of $20,000.

Vallejo Church

Plans for a $10,000 frame and plaster church for the First Methodist Society, are being prepared by Mr. L. M. Turton, architect of Napa.

Unusual Title of Architect

From a Builder in Washington, D. C.—I enclose herewith an actual clipping of the title on a set of blueprints for a large and handsome store building. When it was shown to me I took pains to find out the reason for the peculiar wording of it, knowing that there was no architect in this city by that name. I find as a result of my investigations that the plans were drawn by a well-known draftsman, who did not wish his name to appear, therefore the adoption of the name of an artist now dead for more than 400 years and the peculiar statement at the upper right-hand corner. There were twenty-two drawings in the set and the building is estimated to cost more than $50,000. You might like to reproduce this for the interest which it may have for readers of the paper.—Building Age.

·BENEVENUTO·CELLINI·ARCHITECT·
·308·POPE·BUILDING· ·WASHINGTON·D·C·
·STORE·BUILDING·
·1341·F·STREET·N·W· WASHINGTON·D·C·
·APPROVED·
·DRAWN BY NIGHT·
·TRACED BY HECK·
·CHECKED BY GOSH·
·DRAWING NUMBER·
21
·AUGUST·30·1917·

Facsimile of Architect's Title on a Blueprint

Wisconsin Architects to Be Registered

The architects' registration law has been passed by the Wisconsin Legislature providing that after Jan. 1, 1918, no person doing business in Wisconsin shall make use of the title architect, or so represent himself without a certificate of registration. A board of five examiners will have full power to prescribe rules and regulations for the examination and registering of architects. Candidates will be required to submit satisfactory evidence as to their thorough knowledge of building construction, building hygiene, architectural history and mathematics. Five years' experience is also required.

In lieu of examination, the board may accept a diploma of graduation from a recognized architectural school supplemented by at least three years' experience. Examination may also be waived in cases where an architect is registered in another state or country having satisfactory standards. Any person already engaged in the practice of architecture at the time of the passage of the bill may receive a certificate without examination.

Big Construction Company

The Hedden, Pearson, Starrett Corporation has been incorporated under the laws of the State of Delaware for the purpose of acting as consulting engineers, contractors for engineering work, contractors for operation, purchasing agents and representatives of foreign corporations in the following industries: Steam and electric railways, tramways, highways, bridges, canals, hydro-electric power plants, steam power plants, submarine dredging and rock work, shipbuilding, mining, docks and waterfront improvements, building construction, chemical works, electrical equipments, water works, street lighting, telephone systems, etc.

Mr. William H. Burr, D. Sc., is the director and has been tendered the presidency of the company. The vice-presidents are: Mr. Louis O. Hedden, Mr. Ward E. Pearson, Mr. Theodore Starrett, Mr. Edward H. Beckert, and Mr. John V. Clermont. Mr. Harry J. Kane is the treasurer, and Mr. V. A. Van Valkenburg, secretary.

Business Changes

L. A. Norris Company has opened its own offices in Los Angeles with direct representation under the direction of Mr. H. A. Larsen, manager of sales. The office is located at 833 Citizens National Bank building. The Company is Pacific Coast distributor for Clinton electrically welded fabric, wire lath and welded sheathing. It has been doing business on the Coast for fifteen years, previously having handled its Southern California sales through agencies.

Wybro
Reg. U. S. Pat. Office
The Panels that are as good as they are famous.

244 Varieties of
Wybro Quality Panels

If it's a **different kind** of a panel you require, you will find it among the WYBRO family of 244 varieties.

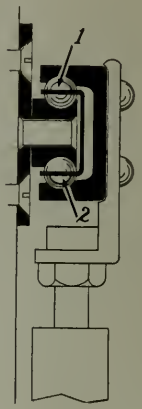
WYBRO PANELS come in all woods and sizes. Each variety is fully as good and worthy of the name.

Whatever "kind" of a panel you need is listed in our Wybro catalogue, which is free to you for the asking.

White Brothers 5th and Brannan Sts. San Francisco

ANNOUNCEMENT

ARCHITECTS familiar with the **RELIANCE DOOR HANGER** and **GRANT PULLEYS** and **HARDWARE** will be interested in the announcement that the manufacturers of these two well known lines have merged their interests.



Reliance Grant Equipment Corporation

PARK AVENUE, COR. 40th STREET
NEW YORK

Pacific Coast Agents

B. V. Collins.....Los Angeles, Cal.
Sartorius Co.....San Francisco, Cal.
Columbia Wire & Iron Works.....Portland, Ore.
D. E. Fryer & Co., Seattle, Spokane and Tacoma, Wash., Great Falls, Montana.

- THE -
ARCHITECT AND ENGINEER
OF CALIFORNIA

AN ILLUSTRATED MONTHLY MAGAZINE OF ARCHITECTURE
AND ENGINEERING

INDEX TO VOLUMES XLVIII—LI

JANUARY—DECEMBER
1917

PUBLISHED BY
THE ARCHITECT AND ENGINEER COMPANY
627-629 FOXCROFT BUILDING, SAN FRANCISCO
Copyright 1917 by A. I. Whitney

THE ARCHITECT AND ENGINEER OF CALIFORNIA

INDEX

Volumes XLVIII - LI — January - December, 1917

A

	Page	Month
Apartment House Designed in the Colonial Type	39	February
Apartment Houses	69	February
Architects, Builders and the Law	80	March
Architects and Contractors, Closer Co-operation Between	82	March
Architects vs. Liability Insurance	90	March
Architectural Sketch Models	57	April
Architectural Terra Cotta, Advantages in Using	85	April
Architecture, Domestic, in California	39	May
Apartment Building—False Standards in Modern	74	May
Architects' Rights to Compensation	91	May
Architects and Architecture, Clarence Wade Discusses	69	June
Architect, The, in War Times	94	June
Architect's Authority, Scope of An	87	July
After the Architect	98	July
Architecture, Domestic	39	August
Apartments, Unique Los Angeles	55	August
Architects and Artists as Camoufleurs, San Francisco	58	August
Accidents on Construction Work	74	August
Architect, The Province of the	99	September
Apartment House, A Chinese	59	November

B

Building, The Santa Fe	55	February
Building, That Particular Building for Peculiar Lot	87	February
Beautifying the Country Estate	73	March
Building, Standard Slow Combustion	71	July
Building for San Francisco, Unique Glass Front	96	July
Building Material Prices, No Drop in	102	September
Bldg. Plans, Willis Polk Writes to Gov. Stephens Anent the State		
Building, The Southern Pacific General Office	61	November
Building, California Cotton Mills New	71	November
Building Controversy, Washington State Capitol	77	November
Berkeley Tennis Club, New Home of the	81	November
Bridge, Oakland-Alameda Bascule	83	November

C

Church, Second Church of Christ, Scientist, Oakland	39	January
Completion, California State Building	39	March
Cogswell Polytechnic College	63	April
Concrete Wharf Supports, San Francisco's Experience With	81	April
Carmelite Monastery	91	April
Conference, The Ninth National City Planning	73	June
City Planning Progress in California	63	July
Construction, Standardized Steel Frame	84	July
City Planning Problem, The Housing Aspect of the	66	August
Competitions	87	August

	Page	Month
Concrete, Effects of Grading of Lands and Consistency of Mix Upon the Strength of	96	August
Concrete Pile Construction on the San Francisco Waterfront	69	October
Color Schemes for Suburban Homes	89	October
City Planning at Santa Rosa, The 4th Cal. Conference on	96	October
Competitions	75	November

D

Decoration, Lace Treatments in	91	February
Decoration, Fundamental Principles of Interior	75	May
Doing Our Bit	78	June
Dry Rot—Its Causes and Prevention	95	September

E

Engineer, The, After the War	77	January
El Paso High Schools, The	87	September

F

Factory Construction in America and Abroad	61	February
Floors and Floor Construction in Office Buildings	85	March
Factory Building in the West	93	April
Fireplaces—Some Unusual	79	May
Fire Department, The Housing of a	51	July
Frieze in the Main Entrance Lobby of the California Theatre, Portfolio of Photographs of the	85	November

G

Gardens, Beauty of Humble	47	January
Garden Gates and Entrances	69	May
Gardens, Highbourne—A Southern California Bungalow Court	39	June
Garden, An Artistic California	65	June
Gov. Recognizes Importance of Ceramic Industry	50	October
Garage Architecture, An Awakening in	79	November

H

House of Lander A. Redman	55	January
Home, A Good, for Every Wage Earner	95	May
Home, The Country, of Today	59	June
Heating, Steam—Reminiscent and Otherwise	80	June
Homes of Well-Known People, Some Attractive	63	October
House, A Bungalow Adaptation of the Swiss Chalet or English Style of	93	November

I

Inventions, Some Needed	92	May
Islam Temple, An Example of Arabian Architecture	93	September
Improvements, Recent, in the Yosemite National Park	39	October
Ideals in Every-Day Architecture and a Passing Tribute to Mr W. Polk	53	October
Interior Decoration, Need of Professional Advice in	86	October
Interior Decoration—The Dining Room	99	November

L

Library, San Francisco's New Public	39	April
Library, The, in the Home	72	May
Laws, New Building, Passed by California Legislature	101	May
Libraries, New Branch, in Los Angeles	79	July
License Law in Idaho, Criticism of the New Architects	91	July
License Law, S. F. Engineer Criticises Amended Architects'	71	August
Library, Planning the	88	August

M

	Page	Month
Memorial, Mary Baker Eddy	47	June
Mullgardt, Work of Louis Christian	39	December

N

New Law Regulating the Practice of Architecture	71	April
New California State Building Laws in Effect	101	September
New York Post Office, Underpinning the	77	October

O

Ocean Beach Esplanade, San Francisco	65	January
Outlook and Inlook, Architectural	77	February
Oak and Its Uses	90	July

P

Paint, Some Observations on	94	April
Plaster, Hardwall	102	April
Plant for the First Congregational Church of Pasadena, A New Working	59	August

R

Railroad Stations, Some California	43	February
Reinforced Concrete, Advantages and Disadvantages of	58	February
Renaissance in Architecture	65	March
Reinforced Concrete Construction, No Mysteries Left in	87	April
Roofing the Home—T-Slate Roofs	83	June
Revised Specifications for Mill Construction	79	August
Relations Between School Boards, Their Supts. and the Architect	59	September
Recent Work of Mr. E. C. Hemmings	57	October
Reinforced Concrete Structure, Severe Test of	75	October
Roof, Merits of a Wooden Shingle	93	October
Return to the Colonial, A	39	November

S

Scholarship, Le Brun Traveling	49	January
Swimming Pools, Municipal and Private	91	January
School House Design, Standardization of	100	January
Structures, Dangerous	54	February
Student Training in An Architect's Office	95	February
Scholarship—Winner of Scholarship Writes of His Work	100	February
Stucco, Artistic	86	May
School House Design, Notes on Recent Progress and Tendencies in	39	September
School Design, Group Plan Is Popular Type in Present-Day	55	September
School Organization, Necessity of Adaptation of Building to	76	September
Some Standards for the School Builder	83	September
Structural Steel in a Building After Seven and Seven and One-Half Years' Life, Condition of	99	October

T

Tunneling Under San Francisco Bay	63	January
Theatre and School Designs (Stage Equipment)	79	January

W

War and the Architect	83	May
Walk—Inclined for Theatre Balconies	90	June
Work, Recent, at the University of California	39	July
Why This Is the Time to Build	82	August

An Industrial Development of Interest to the Building Trade

An advertisement on the opposite page, this issue, calls attention to a development which should prove of interest to all who are connected with the building industry. Mr. H. L. Balch of the Reliance Ball Bearing Door Hanger Company and Mr. U. G. McQueen of the Grant Pulley & Hardware Company, have merged the two enterprises and the business will hereafter be conducted under the name of Reliance-Grant Elevator Equipment Corporation, 101 Park avenue, New York City.

The new company will be sole sales agents for Reliance Ball Bearing Door Hangers and Grant Ball Bearing Door Hangers. They will also handle door controllers, elevator signals and safety devices.

The quality of the lines they handle should enable them to take care of any wants indicated by architects or building trades in the best possible manner.

Reliance goods are very familiar to Pacific Coast architects, who have found the company's elevator equipment, in particular, to be indispensable in buildings of the better type. Reliance door hangers are all that the manufacturers claim for them, being smooth running, noiseless and without complicated features. The Grant pulley is admitted to be one of the best pulleys on the market today and this, with the company's other lines of hardware, should combine to give the new corporation a splendid prestige throughout its field of activity.

The new company will be represented in all large cities, including those on the Pacific Coast.

Gas & Electric Sales Company

The Gas & Electric Sales Company, with a complete new organization, succeeds the Gas & Electric Appliance Company, Inc., 441 Sutter street, San Francisco. This company will carry on not only a retail business in electrical appliances and fixtures, but will figure wiring, gas and electric fixtures, and heating and ventilating in buildings, both public and private.

The officers of the new company are all well known to the trade in San Francisco.

Mr. Thomas Steele is the president and treasurer; Mr. M. J. Purcell is vice-president; Mr. S. Peterson is secretary, and Mr. V. A. Kuehn is manager. The latter will be in charge of the electrical contracting department.

Los Angeles Brick Company Filling Many Orders

The Los Angeles Pressed Brick Company reports a large number of orders for its products from all points throughout the Pacific Coast. Among shipments which have recently been made and contracts which are now being filed are: For architectural terra cotta, First National Bank building at Clarkston, Wash.; Odd Fellows' building at Bakersfield; Hartman and Hauck buildings at Anaheim, and the Morris Plan Bank in Los Angeles; "Red Rug" brick for the Carnegie Library, and roofing tile for the Liberty School building at Salt Lake City; about fifteen carloads of gray wire cut face brick for the Standard Oil Company's building at Bakersfield; wire cut face brick for the Bank of Italy at Fresno; an order for two and one-half million common brick for Arizona; and several good contracts for pressed brick for Phoenix, Flagstaff and other Arizona points. The company recently completed its orders for face brick for the Ville de Paris, Coulter's and Henning blocks of West Seventh street, and for the Stability building at Third and Broadway, Los Angeles.

O'HARA & LIVERMORE

Designers of

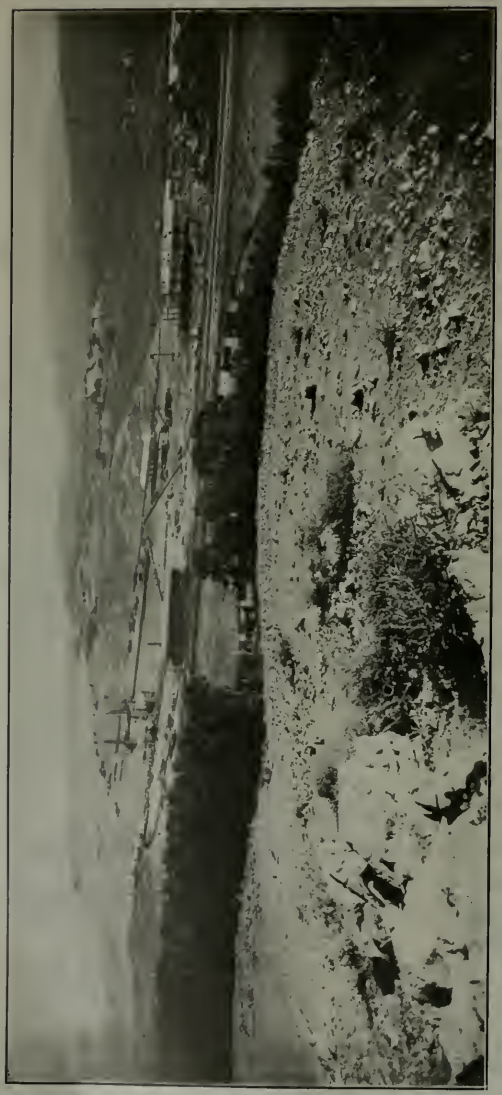
INTERIOR DECORATION

IN ALL ITS BRANCHES

- STUDIOS AT -

522 Sutter Street
SAN FRANCISCO, CAL.
Tel. Sutter 284

251 E. Colorado Street
PASADENA, CAL.
Fair Oaks 2175



SHIPBUILDING PLANT OF SHAW-BATCHER COMPANY, SOUTH SAN FRANCISCO

Steel Company Becomes Builder of Ships

ONE of San Francisco's foremost industries, the Schaw-Batcher Company, has shown its faith in the future development of the shipbuilding industry on the Pacific Coast by investing approximately $1,000,000 in a shipbuilding plant in South San Francisco. This company originally started out to manufacture steel pipe, tanks, etc., but with the declaration of war decided to take up shipbuilding. The company owns 112 acres in South San Francisco and has put in a deep water canal more than 7,000 feet long and 200 feet wide. The plant, now under construction, will comprise the following buildings:

secretary and treasurer.

Shop building, No. 1, 120x300 feet.
Shop building, No. 2, 120x200 feet.
Layingout sheds, 40x700 feet.
Mold loft, 80x200 feet.
Warehouse, 75x150 feet.
Power house, 60x125 feet.
Pipe shed, 50x100 feet.
Joiner's shop, 50x100 feet.
Three ship ways.

The company is said to have the best launching facilities of any plant in the Bay region.

With Government officials and shipbuilders in attendance, the keel of the first of eight steel ships to be constructed for the Emergency Fleet Corporation was laid on November 27th. The craft is expected to be finished in April.

Each of the eight ships will be of 8800 tons register, and will be operated by the Emergency Fleet Corporation to keep American commerce moving on the seven seas. It is expected all eight vessels will be rushed to completion. The boats are to cost $11,000,000.

Captain A. F. Pillsbury represented the Emergency Fleet Corporation at the laying of the keel on November 27th. Among the others present were all the officials of the Schaw-Batcher Pipe Works, Messrs. John A. McGregor and J. J. Tynan of the Bethlehem Shipbuilding Corporation, and George Armes, who has resigned as chief engineer on the Pacific Coast of the Bethlehem Company to take the position of chief engineer with the Emergency Fleet Corporation.

The plant is being constructed by Mr. H. P. Hoyt, Monadnock building, San Francisco, and is about two-thirds completed. The force will be increased as additional buildings are finished. Mr. C. L. Moorman, vice-president, says the company unquestionably has one of the best equipped steel plate shops on the Pacific Coast, which accounts for his firm getting such speedy results in actual construction work. The other officers of the company are Mr. John H. Batcher, president, and Mr. F. R. Veach, secretary and treasurer.

Protected from Water Damage

LYON STORAGE WAREHOUSE
OAKLAND, CAL.

Richardson & Burrell, Architects — F. A. MULLER, Contractor

The brick walls of this modern warehouse are water and moisture proof. Its structural permanence and the safety of its contents are thus completely insured. This waterproof result was obtained by the use of

IMPERIAL WATERPROOFING

LOOK FOR THE LABEL

REED BAXTER

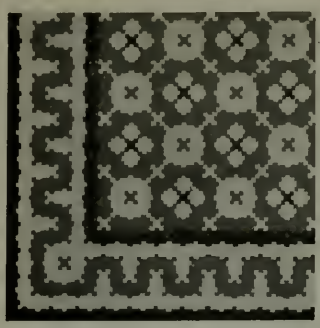
CONSERVATION ENGINEER and CONTRACTOR
WATERPROOFING and PRESERVING PROBLEMS

1002-4 Merchants National Bank Bldg., San Francisco, California
Telephone KEARNY 2718

3419 Broadway, Oakland, California
Telephone
Piedmont 3536W — Oakland 1198

IF YOUR BASEMENT LEAKS - SEE ME

"Baxter Service First - Will Always Last"



The Elevator Floor—

Whether in Office Building, Hotel or Department Store is subjected to an enormous amount of wear and tear.

Specify

Interlocking Rubber Tiling

and you've provided your client's building with a Durable, Economical, Practical material that is bound to give satisfaction.

Stock on hand for immediate delivery.

New York Belting and Packing Co.

New York

San Francisco Branch

519 MISSION STREET

Phone Douglas 1837

Small booklet of designs mailed on request.

OFFICIAL STATE ADVERTISEMENT

Competition Announcement

The Board of Control of the State of California announces to all Architects who are citizens of the United States:

That a Competition has been instituted for the selection of an Architect to design and supervise the construction of State Buildings to be located in the city of Sacramento, California, for the construction, equipment and furnishing of which the people of the State of California have voted $3,000,000.00 in bonds, the site having been donated by the city of Sacramento.

Under the law, the State Architect shall act as architectural advisor in connection with the Competition.

This Competition will be conducted in two stages.

The first stage is open to all Architects, citizens of the United States, who have had the necessary experience, subject to the conditions prescribed in the Programme of the Competition.

The second stage will be open to eight Architects selected by the Jury from those competing in the first stage.

No competitor shall receive any remuneration unless chosen by the Jury and submitting drawings in the second stage.

The Programme for this Competition is approved by the San Francisco Sub-Committee on Competitions of the American Institute of Architects.

Architects desiring to compete must file with George B. McDougall, State Architect, Forum Building, Sacramento, California, a written request for a copy of the Programme. On December 15, 1917, copies will be mailed simultaneously to all Architects from whom written requests for same have been received. Copies will be mailed to Architects making written requests for same after December 15, 1917, at the time of the receipt of such later requests.

(Signed) BOARD OF CONTROL OF THE STATE OF CALIFORNIA.

Marshall De Motte, Chairman;
Clyde L. Seavey,
Edward A. Dickson,
Members of Board of Control.
P. J. Tehaney, Secretary.

Dated: November 1, 1917.

Berkeley City Engineer Resigns

Mr. J. J. Jessup, for seventeen years connected with the engineering department of the city of Berkeley, has resigned, and his assistant, Mr. Clyde C. Kennedy, who installed the new $600,000 sewer system, has been appointed by the Berkeley City Council to succeed him.

To Be "Low Bidder" Not Always Our Aim.

Our most particular attention is given to prompt and skillful handling of all electrical work of any nature with "QUALITY AND SERVICE GUARANTEED."

Our nation-wide organization and large experience in this field assures you always of fair estimates and absolute satisfaction.

F. E. NEWBERY ELECTRIC CO.

163 Sutter St. (413 Lick Bldg.) San Francisco, Phone Sutter 521

ASBESTOS PROTECTED METAL FOR ROOFING AND SIDING

For permanent industrial buildings of all classes.
Economical — Low maintenance.
Permanent without paint under the most severe conditions of service.

ASBESTOS PROTECTED METAL CO. Ask for Bulletin.

First National Bank Bldg., PITTSBURGH San Francisco Office, Hobart Bldg.

ELECTRIC WIRING AND FIXTURES HEATING AND VENTILATING

AGENTS FOR

HUMPHREY AUTOMATIC HEATER

GAS & ELECTRIC SALES CO.

441 Sutter Street, San Francisco

"LENNIG SYSTEM"

ELECTRIC HEATING RADIATOR with Automatic Temperature Control

The THERMOSTAT and THERMOPILE are only sold to Manufacturers and the Trade. Not at retail and not to be installed by this company.

Contractors and Dealers in Plumbing and Heating Goods—Ask for detailed information. Our proposition will interest you.

THERMIC ENGINEERING COMPANY *CLAUS SPRECKELS BUILDING, SAN FRANCISCO*

DESIGNERS OF FIXTURES

GOOLD & JOHNS

ELECTRICAL CONTRACTORS AND ENGINEERS

Phone 1-1-1-1 113 S. California St., STOCKTON, CAL.

San Francisco, Cal. Oakland, Cal. Los Angeles, Cal.

NEPAGE, McKENNY CO.

Electrical Engineers and Contractors

Phone Sutter 2369 149 New Montgomery St., San Francisco, Cal.

H. W. Fincke Geo. C. Derby

IDEAL HEATING & ENGINEERING CO.

FAN SYSTEMS FOR HEATING AND COOLING

General Sheet Metal Work Warm Air Furnaces
Ideal Air Washers Blow Pipe Systems

PHONE MARKET 3708 192 ERIE STREET, SAN FRANCISCO

CITY OF PARIS

Decorative Studios

GEARY AND STOCKTON STS. SAN FRANCISCO

DON'T WAIT — OR LOSE TIME HUNTING
Get the Man You Want Instantly. USE THE

"National Calling System"
THE INSTANT MAN FINDER

WESTERN REPRESENTATIVES:
Sierra Electric Construction Company
619 CALL BUILDING, SAN FRANCISCO Phone Sutter 2297

HIGH GRADE
ELECTRICAL CONSTRUCTION WORK
FOR BUILDINGS

BUTTE ENGINEERING AND ELECTRIC CO., 683-87 Howard Street,
SAN FRANCISCO, CAL.

PACIFIC FIRE EXTINGUISHER CO.
ENGINEERS AND CONTRACTORS

Heating and Ventilating, Electrical Installations, Fire Extinguishing Apparatus

THE GRINNELL AUTOMATIC SPRINKLER
Main Office: 507 MONTGOMERY STREET, SAN FRANCISCO, CAL.

Branch Offices:
217-218 Colman Building - - - - - - - - Seattle, Wash.
504-505 McKay Building - - - - - - - - Portland, Ore.
826 Paulsen Building - - - - - - - - - - Spokane, Wash.
503 I. W. Hellman Building - - - - - - - Los Angeles, Cal.

Ask the Architect-He Knows

where you can get good and suitable lighting fixtures for your new building. He is interested in having the lighting brighten (not deaden) the effects he has sought to accomplish in his architectural design. He will, doubtless, advise you to go to ROBERTS MFG. COMPANY, 663 Mission Street, San Francisco, where you will find the largest stock to select from, all at equitable prices.

LET IT RAIN

BAY STATE

Brick and Cement Coating

will keep your walls "Dry as Noah's Ark" and insure that even, new finish in a selection of colors for years.

Wadsworth, Howland & Co., Inc., Makers

BOSTON, MASS.

DISTRIBUTING AGENTS:

JAMES HAMBLY & SONS, 268 Market Street, San Francisco, and 447-449 East Third Street, Los Angeles

J. B. Winstanley & Co., - - - Portland, Ore.
F. T. Crowe & Co., - - - - - - Seattle, Wash.
Jones-Moore Paint House, - - San Diego, Cal.

Imperial Waterproofing Has New Distributor

Mr. Reed Baxter, who has been made sales agent of Imperial Waterproofing for San Francisco and the Bay territory, reports the outlook encouraging for the coming year. He finds architects very familiar with this product, and those who have specified it do not hesitate to praise its high qualities. Imperial Waterproofing is now manufactured in San Francisco by Messrs. Brooks and Doerr, who are giving their entire time to the industry. Imperial is a chemical solution, water base and non-combustible, and its waterproofing qualities are said to have a more efficient effect in San Francisco's peculiar salt air climate than any other similar method. It is used as a preservative also, and when applied to stone, brick or cement surfaces will not change the natural color or texture.

Messrs. Brooks and Doerr have copyrighted a trade mark and in the future all cans and boxes containing the genuine Imperial product will bear this trade mark.

Mr. Baxter has had several years' experience in the waterproofing line and will be pleased to lend his services to architects and others interested.

Oakland Hotel Alterations

Plans have been prepared by Mr. F. D. Voorhees, architect in the Central Bank building, Oakland, for alterations to a local hotel to cost approximately $30,000.

Successful Advertising

In an address before the members of the Manufacturers' Committee of the Oakland Chamber of Commerce, at a joint meeting with the Home Industry League of California, Mr. Charles R. Thorburn, secretary of the League, had this to say about advertising:

"Advertising is so broad a subject that it is seemingly impossible to decide where it begins and where it ends. Every action of a merchant, or of his employees, advertises the firm. How long the effect of the action goes on before it ceases operations merely offers food for speculation.

"One of the foremost advertisers in New York has said, that 'the art of advertising is merely presenting attractively the absolute truth concerning goods to be sold.' When the proposition is carefully thought out, its aptness will be fully realized. What should be sought in the use of any medium of advertising is the relating of facts concerning that which the merchant has for sale.

"Successful advertising is not that which is done by fits and starts; neither is it that which is prepared because the space has been purchased and must be used. Space filling is not advertising. There should be something to advertise before the advertiser sits down to write an advertisement."

SKETCHES OF THE PRINCIPAL CHARACTERS IN LIFE'S TRAGEDY, "BUILDING A HOME"

The Hetch Hetchy Dam

Speaking of work on Hetch Hetchy water supply project, City Engineer M. M. O'Shaughnessy is reported as saying that the scheme, when developed, will result in bringing enough water here to supply San Francisco and bay cities for the next 100 years.

Mr O'Shaughnessy says that it is three and a half years since President Wilson signed the Hetch Hetchy grant bill.

The dam, for which contracts soon will be let, will be of reinforced concrete, 400 feet in height and 850 feet in length along the crest. The thickness at the crest will be 25 feet, and at the base 320 feet. This dam will impound a reservoir nine miles in length, with a storage capacity of 112 billion gallons of water.

ROBERT W. HUNT JNO. J. CONE JAS. C. HALLSTED D. W. McNAUGHER

ROBERT W. HUNT & CO., ENGINEERS

BUREAU OF INSPECTION TESTS AND CONSULTATION

251 KEARNY ST., SAN FRANCISCO

NEW YORK LONDON CHICAGO PITTSBURGH ST. LOUIS SEATTLE TORONTO MEXICO CITY

CEMENT INSPECTION

INSPECTION OF STRUCTURAL AND REINFORCING STEEL

REPORTS AND ESTIMATES ON PROPERTIES AND PROCESSES

CHEMICAL AND PHYSICAL TESTING LABORATORIES

Draftsmen Wanted for Army in France

The United States Engineering Department at Large has issued a circular addressed to architectural, mechanical and topographical draftsmen, clerks, bookkeepers and stenographers calling attention to the chances for positions with American Expeditionary forces in France. These positions are open only to men above the draft age, or men within the draft age who have been disqualified. The department wants fifty draftsmen and 150 clerks, stenographers and bookkeepers.

The salaries range from $1800 to $2400 for draftsmen, and from $1000 to $1200 for clerks, stenographers and bookkeepers, depending upon experience and qualifications. The salary will also include rations, housing, medical and surgical attention, and transportation from place of appointment. Further information may be obtained by applying to Chief of Engineers, U. S. A., room 252 Old Land Office Building, Washington.

Construction Company Will Send Its 1,000 Workmen to France

Mr. R. B. Oliver, president of the Oliver-Hill Construction Company of Knoxville, Tenn., has submitted an offer to the federal government to send its entire construction plant and 1,000 negro workmen to France. Even should it prove impracticable to accept such an offer, the patriotic spirit that prompted it will be thoroughly appreciated. Doubtless there are many more contractors who would gladly come forward with similar offers if the government were to indicate that it would welcome such action. Half a year ago the Walsh Construction Company of Davenport, Ia., made to the government an offer similar to that of the Oliver-Hill Construction Company. But the government did not at that time appreciate fully the war services that might be rendered by a large construction company.

Opens Oakland Offices

The F. E. Newberry Electric Company, with offices in St. Louis, Chicago, Kansas City, Dallas, Houston, Los Angeles and San Francisco, announce the opening of an office in Oakland at 313-314 Realty Syndicate building, in charge of Mr. V. A. Farren, manager. The company has the wiring contract for the new six-story Tribune building.

LOOK through the advertising pages each month. Make it a point to send for some of the printed matter offered by manufacturers and building material houses. And when you are writing or phoning for a contractor or material man to call and figure tell him you saw his card in The Architect and Engineer.

STERLING MOTOR TRUCKS

A complete line in stock for immediate delivery.

EDWARD R. BACON COMPANY, Pacific Coast Agents

51-53 Minna Street, San Francisco Telephone Sutter 1675

How the Big Cantonments Were Planned

SUPPOSE Uncle Sam stepped up to you on the street today and said:

"Look here, son, I want you to build me sixteen cities. Put them in various parts of the country. Plan each one for a population of 40,000 men. Have heating, lighting, water, ventilation and sewerage systems perfect in all of them. Finish them in three months. That's your job. Now go to it."

Would you know where to begin?

Would it excite you at all to realize that every mistake you made meant perhaps fatal delay in the training of your country's armies for the war?

That proposition was put up to one man by Uncle Sam. He and his colleagues shouldered the burden and did the job.

The man was Maj. W. A. Starrett, before the war an architect, now chairman of the committee on emergency construction and contracts of the Council of National Defense.

No such task had ever been undertaken on a nationwide scale in that space of time.

"When this thing was first contemplated," Maj. Starrett told the United Press, "the government provided a couple of army officers and stenographers to do the job."

Word had gone out that the work was going on and every contractor in the country was here. As a result, all those men did was to stand in front of the desk and shake hands all day.

We told the munitions board these people would have to be taken out and that the cantonment men would have to be let alone.

Accordingly the next morning the men were brought to the Munsey building with their records. We immediately saw the need for the finest men we could get, so we reached into the big engineering organizations all over the country by wire and telephone.

We asked them to send big men. We got big men. I could name you a list of twenty-five men we got who were worth $15,000 to $25,000 a year.

We said to those concerns: "You will have to give these people up. We face an emergency." They patriotically gave them up.

Then and there over about two days and nights solid conference work with all these people we built a great organization under Col. Little of the war department.

Inside of four days we had the organization in skeleton. Everything was worked out with the object of speed and economy. That machine constitutes about 250 people occupying a whole building and working anywhere from twelve to eighteen hours a day. We looked around to see what the govern-

MUNICIPAL FIRE HOUSE, San Francisco
Ward & Blohme, Architects

An alarm of fire —

in a fire house means quick action on the part of every man stationed there. Smooth-running doors help to make speed. That is why

PITCHER
SLIDING DOORS

are used in the fire house illustrated above. These hangers are used in many other fire houses throughout the city.

NATIONAL MILL AND LUMBER COMPANY

326 Market Street, San Francisco
Mill and Yards, Alameda

KEWANEE	YEOMANS	LOUDEN
GARBAGE BURNERS AND BOILERS	BILGE PUMPS EJECTORS HOUSE PUMPS	SANITARY BARN EQUIPMENT

CALIFORNIA HYDRAULIC ENGINEERING & SUPPLY CO., 80 Fremont St., S. F.

Phone MISSION 4405

P. R. WARD Formerly Ward & Goodwin

GENERAL CONTRACTOR

981 GUERRERO STREET SAN FRANCISCO

ONE PIECE SANITARY DRAINBOARDS, SINKBACKS, FLOORS, WAINSCOTING, ETC.

GERMANWOOD FLOOR CO.

Phone West 4009 1621 EDDY STREET, SAN FRANCISCO

HOWARD CO.

CEMENT, ROCK, PLASTER, GRAVEL, BRICK and SAND

Phone Lakeside 27 1st and Market Sts., Oakland

G. W. COURTNEY

CONTRACTOR

Phone Franklin 4800 160 EDDY STREET, SAN FRANCISCO

A. D. COLLMAN

GENERAL CONTRACTING

Phone Sutter 3580 110 Jessie Street, San Francisco

PLUMBING HEATING

NEIL H. DUNN

CONTRACTOR

786 ELLIS STREET, S. F. Phone Franklin 2187

J. B. CROWE

Glass of All Kinds

1372-74-76 TURK ST., SAN FRANCISCO Tel. West 1398

LANDSCAPE ARCHITECTS
NEAL T. CHILDS COMPANY Phone Sutter 4933
WE PLAN HOME GROUNDS AND REALTY TRACTS 68 POST STREET
TREE SURGERY AND CONSULTING FORESTRY SAN FRANCISCO

ment had in the way of a register of contractors. It did not have anything for us. We asked the American Institute of Architects, the chief engineers of all the railroads and big industrial establishments, who the reliable people were they had been dealing with. In ten days we had 1800 replies, giving us a list of about 1000 contracting firms. We put the list in charge of Mr. McGibbon of the Chicago Fidelity and Guaranty Company. He determined that contractors throughout the country were doing $5,000,000 a year business. There were about 100. These we separated and cross-referenced them geographically. This gave us sixty or seventy concerns based on their proximity to the sixteen military divisions of the country. We considered our preferred contractors by these geographical groups. We got what the architects and engineers said about each man, and what each man said about himself and what others said about him. Thus when we came to the selection we had the available, competent firms and their respective records before us.

The applicants really selected themselves.

Secretary Baker sent us a communication saying all things being equal to pick the contractors from the locality in which the camp was to be located. That was common sense. We were in a position to do what he suggested.

"You feel then," it was asked, "that everything humanly possible was done to safeguard the interest of both the government and the public in the selection of these contractors?"

"Yes, I do," said Maj. Starrett. "It is just like any other emergency work. You have to know as many facts as you can and be as just as you can, but you have to move and do something."

LOOK through the advertising pages each month. Make it a point to send for some of the printed matter offered by manufacturers and building material houses. And when you are writing or phoning for a contractor or material man to call and figure tell him you saw his card in The Architect and Engineer.

NEED GEARS ?

NEED BEARINGS ?

NEED CLUTCHES

or anything else in the line of Conveying, Elevating, Screening or Power Transmitting Machinery?

THEN CALL UP

Meese & Gottfried Company

Engineers and Manufacturers

SAN FRANCISCO SEATTLE PORTLAND LOS ANGELES

CHARLES T. PHILLIPS
CONSULTING ENGINEER
PACIFIC BUILDING SAN FRANCISCO
HEATING VENTILATION WIRING ILLUMINATION

Fisher Flouring Mill, Seattle, Wash. 125 tons of black and galvanized Armco Iron used for roofing, ventilators, bins, hoppers and chutes.

The Iron That's Made To Last

demonstrates its superior quality in hundreds of uses.

ARMCO IRON Resists Rust

because of its remarkable Purity and the care and skill bestowed on every phase of its production.

Refuse Burner of Blue Annealed Armco Iron, built by the Walsh Construction Co. of Vancouver, B. C., for Hunting & Merritt Lumber Company.

AMERICAN ARMCO INGOT IRON

The trade mark ARMCO carries the assurance that iron bearing that mark is manufactured by The American Rolling Mill Company with the skill, intelligence and fidelity associated with its products, and hence can be depended upon to possess in the highest degree the merit claimed for it.

THE AMERICAN ROLLING MILL COMPANY
MIDDLETOWN, OHIO

Licensed Manufacturers under Patents granted to the International Metal Products Company

ARMCO Iron Sheets, Plates, Roofing, Pipe, Gutter and Metal Lath

Pacific Coast Sales Office — Monadnock Building San Francisco, other Branch Offices in New York, Chicago, Pittsburgh, Cleveland, Detroit, St. Louis, Cincinnati, Atlanta, and Washington, D. C.

AN AMPLE STOCK OF ARMCO IRON IS CARRIED AT SAN FRANCISCO

FACTORY AND YARDS, COVERING ONE HUNDRED ACRES, NATIONAL MILL AND LUMBER COMPANY

Largest Planing Mill and Lumber Yards in California

OCCUPYING a 100-acre site along the Oakland waterfront, the Pacific Tank & Pipe Company may be said to enjoy the largest yard space and water frontage of any similar industry doing business on the Pacific Coast, and besides this immense plant in Oakland, the company maintains a large warehouse together with executive offices in San Francisco. Merged with the Pacific Tank & Pipe Company are the National Mill and Lumber Company and the Mercantile Box Company. The first named enterprise has a coast-wide reputation as the manufacturer of redwood tanks and wood pipe. Products of the planing mill of the National Mill & Lumber Company may be found in many of San Francisco's best built public and private buildings, while the Mercantile Box Company has produced thousands upon thousands of boxes for use all over the United States. The officers of the company are Mr. E. C. Pitcher, president; Mr. R. R. Streets, vice-president; Mr. G. F. McArthur, secretary; Mr. F. W. Schmitz, manager, and Mr. T. T. Gerken, chief engineer.

It was largely through the foresightedness of the company's president, Mr. Pitcher, that the extensive plant was established on the Oakland estuary the mill and yards in San Francisco being abandoned first because of insufficient room and second, because of inadequate transportation facilities. The mile of water frontage on the Tidal canal is crescent shaped, extending from High street on the canal to Bay street on an arm of San Leandro bay, providing excellent dockage, while railroad industry spurs and good streets are laid out throughout

RESIDENCE DESIGNED BY HENRY SHERMUND, ARCHITECT
Equipped with Pitcher Door Hangers

the tract, which has shipping connections over three transcontinental lines, the Southern Pacific Company, the Atchison, Topeka & Santa Fe, and the Western Pacific Railway. Cars are loaded for shipment on a depressed track and loads are switched out at night; during the day spotting of cars is taken care of by a locomotive crane, with which the company also does much of its lumber handling. Carloads of millwork for San Francisco are expeditiously handled by a traffic arrangement with the Western Pacific Railway. Loads are spotted at the warehouse of the National Mill & Lumber Company, Kansas and Alameda streets, San Francisco, at 7:00 o'clock on the morning following completion of loading at the plant, and are made ready for distribution by the company motor trucks direct to San Francisco customers.

The plant comprises four main buildings from 225 to 300 feet long and 100 feet wide. The main building is the planing-mill, which extends about east and west, parallel to the Tidal canal and within easy access of the lumber yard, which is located between the canal and the planing-mill, in separate subdivisions Douglas fir (Oregon pine), redwood and spruce. All millwork is finished in the general planing-mill, also all surfacing for tank, pipe and box factories, which lie side by side north of planing-mill and extending north and south at right angles to it. At these three factories the different products suggested by the names—tank, pipe and box—are specifically brought to completion

East of the planing-mill is the power plant, also the dry kilns (North Coast), built of hollow tile walls, a wood and sawdust bin is near the box factory, which

MODERN PLUMBING FIXTURES

HAINES, JONES & CADBURY CO.
MAKERS OF PLUMBING SUPPLIES
1130-1144 RIDGE AVENUE PHILADELPHIA
BRANCHES - SAVANNAH AND SAN FRANCISCO
San Francisco Office and Showroom
857 Folsom Street

H. H. LARSEN, 101 Woodland Ave. N. LARSEN, 230 Haight St.
H. H. LARSEN & BRO.
MASONS and BUILDERS
Phone Douglas 4249 Office 62 POST ST., Room 331, San Francisco

E. E. CARNAHAN
1403 McAllister St., Phone West 3608
E. S. MULFORD
1282 Sacramento St., Phone Franklin 8776
CARNAHAN & MULFORD
GENERAL CONTRACTORS
Telephone Kearny 4195 504 LUNING BLDG. 45 Kearny St., San Francisco, Cal.

Atlas Heating and Ventilating Co., Inc.
ENGINEERS and CONTRACTORS
STEAM AND HOT WATER HEATING, FANS, BLOWERS, FURNACES, POWER PLANTS—SHEET METAL WORK
Phone Douglas 378 Fourth and Freelon Sts., Bet. Bryant & Brannan, SAN FRANCISCO.

J. W. BENDER ROOFING & PAVING CO.
(Members of Builders Exchange, 180 Jessie St. General Contractors Assn., 110 Jessie St.)
WATERPROOFING AND COMPOSITION ROOFING
MASTIC AND BITUMEN PAVING
General Offices:
576 Monadnock Building San Francisco Telephone Douglas 4657

HEATING VENTILATION
Automatic Sprinkler Systems
FLOOR AND WALL TILING
PLUMBING SHEET METAL WORK
SCOTT CO., INC.
SUCCESSOR TO JOHN G. SUTTON CO.
243 MINNA STREET SAN FRANCISCO

BARRETT & HILP
Concrete Construction & General Contractors
SHARON BUILDING SAN FRANCISCO SUTTER 4598

Dolan Wrecking & Construction Co.
(D. J. DOLAN)
Lumber, Lath, Nails, Shingles, Doors, Windows and Plumbing Supplies, New and Second Hand
Phone Market 4264 Office and Yard, 1607-1639 MARKET ST., SAN FRANCISCO

When writing to Advertisers please mention this magazine.

APARTMENTS FOR THE TOWNE REALTY COMPANY, SAN FRANCISCO
Equipped with Pitcher Door Hangers

obviates all possible waste—every by-product being utilized. A blow-pipe and conveyor system has been installed throughout the plant to take care of these by-products economically.

It is the boast of the three concerns, now operated under one head, that the sun never sets on the products of their mills. They are found in the jungles of the Philippines, under the snows of Alaska, along the mountains of South America, and in the sugar plantations of Honolulu.

Fifteen miles of 27-inch wood pipe carry water to the city of Port Arthur, Texas. Water from Lake Spaulding to a Pacific Gas and Electric Company power plant flows through a mile and a half of 5-foot and 8-foot pipe. The Anaconda Copper Company at Chanaral, Chili, has used 110 miles of wooden pipe. San Diego is getting water through ten miles of 30-inch pipe. Recently the War Department ordered 100 carloads of various sizes for cantonment purposes.

One of the company's recent large installations was the erection of a battery of 200 tanks for the Hercules Powder Company. The tanks, which have a total capacity of 12,000,000 gallons, form a part of the powder company's kelp reducing plant at San Diego.

All the tanks and towers along the Sun Ning railroad in China were erected by this California concern. Japan also has some examples of its work. Scores of mines in western America have been equipped by it.

As previously stated, many of the largest and best designed buildings in San Francisco and the bay cities are finished inside with materials from the National Mill & Lumber Company. Among the products of this mill are Pitcher door hangers, the invention of the company's president, and which have a coast-wide reputation for their smooth running, noiseless qualities.

Read These Facts

OF EVERY 100 IN AMERICA:
82 Die penniless.
15 Leave under $10,000
3 Leave over $10,000

OF 100 AVERAGE MEN IN U. S.
46, At 45, have saved nothing
30, At 45, need aid
4 Of the 64 alive at 65 are able to [illegible] charity

OF EVERY 100 WIDOWS
47 Have to work
38 Are supported by charity
18 Are left well off

OCEAN SHORE IRON WORKS

JOHN TRAYNOR CHARLES HARCOURT

550 - 558 Eighth Street
San Francisco

MANUFACTURERS OF

OIL TANKS
WATER TANKS
PRESSURE TANKS
AIR RECEIVERS
FEED WATER HEATERS
BREECHINGS
SMOKE STACKS
WATER PIPE
BOILERS
RETORTS
DIGESTORS
PNEUMATIC PRESSURE TANKS
SHIP TANKS
RIVETED or OXY-ACETYLENE WELDED TANKS

AND DEALERS IN

BOILERS
TANKS
PUMPS
ENGINES
MACHINERY
STEEL PLATES
SHAPES

Special Attention Given to Government and Export Orders.

Ocean Shore Iron Works

Office and Works:

550-558 Eighth St. **San Francisco, Cal.**

KOHLER WARE

Always of one quality—the highest

means a pleasing bathroom

A bathroom containing the original, *one-piece* built-in bath, the "Viceroy" produced by KOHLER OF KOHLER, is sure to be a permanent source of delight to your clients.

This bath, illustrated below, with its *one-piece* construction, graceful lines and KOHLER pure white enamel, has become America's foremost built-in bath. And leading architects are specifying it for buildings of all classes that require the best in plumbing ware.

The KOHLER line includes lavatories and sinks of the same distinctiveness.

The name KOHLER, in faint blue in the enamel, is our pledge that each piece of KOHLER WARE represents first quality.

Write for our new book, "KOHLER OF KOHLER."

KOHLER CO., *Founded 1873* **Kohler, Wis.**

Boston New York Philadelphia Pittsburgh
Detroit Chicago Indianapolis St. Paul
St. Louis Houston San Francisco
Los Angeles Seattle London

Schaw-Batcher Co.
Pipe Works

RIVETED STEEL PIPE
PRESSURE TANKS
STORAGE TANKS
WELL CASING

ALL KINDS HEAVY STEEL PLATE WORK

356 Market St., San Francisco Works, South San Francisco

Guaranteed Results in Waterproofing and Hardening Concrete, Brick, Stone, Etc.

BY THE

GOFFETTE Preparations

A perfectly successful, simple and inexpensive method of waterproofing and hardening concrete, brick and stone has been worked out by Prof. J. L. Goffette, a Belgian chemist and engineer of high standing.

MANUFACTURED BY

J. L. GOFFETTE CORPORATION

Factory and Warehouse, San Bruno Ave., San Francisco

THE GOFFETTE SALES ASS'N
General Sales Agents
276 Monadnock Bldg., San Francisco

R. E. G. KEENE
Distributor for Northern California
110 Jessie Street, San Francisco
Phone SUTTER 3580

Territory is open for responsible state or district sales agents, correspondence invited. Address GOFFETTE SALES ASSOCIATION, 276 Monadnock Building, San Francisco.

Atkinson Safety Window

Mill
Second
and
Webster
Streets
Oakland

ESTABLISHED 1858

MUELLER

High Grade Faucets

FOR

BATH, LAVATORY AND SINK

Give Long Service, Cut Out Repairs, Fully Warranted

H. MUELLER MFG. CO.

589 Mission St., SAN FRANCISCO

C. DRUCKER J. C. JAMES

JAMES & DRUCKER

PLUMBING—HEATING
CONTRACTORS

Phone
Market 275

450 Hayes Street
San Francisco

MARK-LALLY CO.

PLUMBING and STEAM SUPPLIES

"PERFECTION"
FLUSH VALVES

SHOWROOMS AND OFFICE

235-249 2nd St., San Francisco
CALIFORNIA

OAKLAND
SAN JOSE

Branches

FRESNO
STOCKTON

Phone Douglas 3224

Hunter & Hudson

ENGINEERS

Designers of Heating, Ventilating and Wiring Systems. Mechanical and Electrical Equipment of Buildings.

703 Rialto Bldg., San Francisco, Cal.

The McGilvray Stone Company

MASONRY AND STONE CONTRACTORS

OPERATING

Duntrune Quarry, at Sites, Colusa County, Cal.

The McGilvray Raymond Granite Co.

CONTRACTORS

For and Dealers in Granite Work of Every Description

Quarries at Raymond, Cal.

Offices, 634-666 Townsend Street, San Francisco

PHONE FRANKLIN 5598

THE TORMEY CO.

Versatile Decorators

General Painters

Wall Paper

1042 Larkin St., San Francisco, Cal.

Paints, Oils, Varnishes

ENAMELS

Pacific Coast Paint Corporation

General Offices and Works:

1111 to 1119 East 11th Street,

OAKLAND, CAL. Phone Merritt 407

Phone Sutter 1687

THE RIGNEY TILE CO.

Successors to

CALIFORNIA TILE CONTRACTING CO.

ESTIMATES FURNISHED

Sheldon Building
1st and Market Sts. SAN FRANCISCO

"BLAZING" THE TRAIL

We've been doing it for many years—giving the Sportsman Better Value for Quality than he ever before received. *"Value at a Fair Price"* in everything for the Sportsman.

The Ellery Arms Company
583-85 MARKET ST
SAN FRANCISCO, CAL.

SEND FOR CATALOG *The Sign of Quality*

National Surety Company of New York

ASSETS OVER $12,000,000.

The bonds of this Company are accepted by the United States Government in larger amounts than any other Surety Company in the World.

PACIFIC COAST DEPARTMENT,
105 MONTGOMERY STREET,
SAN FRANCISCO, CAL.
Frank L. Gilbert, Vice-President.
Phone, Sutter 2636

KEWANEE WATER SUPPLY SYSTEMS

Phone
Kearny 1457

A Perfect Water Supply to Country Homes, Hotels and Parks.

SIMONDS MACHINERY CO.
117-121 New Montgomery St., San Francisco

SIMPLEX STANDARD CRUDE OIL BURNERS

Safety First
Simplicity Next
Efficiency and Quality all the Time
1916 Model—Price Right

Write to
American Standard Oil Burner Co.
7th and Cedar Sts. OAKLAND, CAL.

A. J. FORBES & SON

Established in San Francisco in 1850

Office and Factory, 1530 FILBERT ST., S. P.
Builders Ex. Box 236

Bank, Store and Office Fittings

Special Furniture and Interior Woodwork

MAGNER BROTHERS

PAINT MAKERS

We have purchased the business of the Jones-Duncan Paint Company, including formulae and brands, and can now supply the trade with ALVALINE, CEMENTOLINE and other Jones-Duncan products, as well as our own well-known line of paints.

NEW ADDRESS: 414-424 Ninth St.
NEW TELEPHONE: Market 113.

When writing to Advertisers please mention this magazine.

"Chief Sentry" Gasoline Outfit

BOWSER
ESTABLISHED 1885

Oil and Gasoline Storage Systems

Are specified in modern garages. Include Bowser Equipment in your plans. It means satisfied clients for you because of the saving, safety and complete convenience of the Bowser System.

Write or 'phone us. We will be glad to co-operate with you in planning oil storage systems for all classes of buildings.

S. F. Bowser & Co., Inc., Ft. Wayne, Ind., U. S. A.

San Francisco Office
612 Howard St.

Telephone
Douglas 432 3

JOOST BROTHERS, Inc.

1053 Market St., Opposite Jones, San Francisco.

Phone MARKET 801

A FEW SUGGESTIONS FOR THE HOLIDAY SEASON

ILLETT" Safety Razor
"Hot Point" Electric Iron
"Universal" Percolator
Electric Vacuum Sweeper
"Robeson" Carving Set
Toolchest of Tools
"Ingersoll" Wrist Watch
Pearl Handled Pocket Knife
A "Wear Ever" Aluminum Roaster
"Winchester" Automatic Shot Gun

Skates — Boots — Casseroles — Flashlights

There are more Industrial Buildings under construction and being planned in California today than ever before. Many of them are concrete.

Architects and Consulting Engineers specify and Contractors Buy ONLY Clean Gravel and Crushed Rock for their Concrete Mix.

California Building Material Co.

Office, 500-4 NEW CALL BUILDING, SAN FRANCISCO

Phone Sutter 4845 Plant at Niles, Cal.

Pack your Radiator Valves with

Palmetto Twist Packing

It can be unstranded to fit any size valve. It does not get hard.

H. N. COOK BELTING CO.

317-319 Howard St. San Francisco, Cal.

MOUNT DIABLO CEMENT
COWELL SANTA CRUZ LIME

ALL KINDS OF

BUILDING MATERIALS

HENRY COWELL LIME AND CEMENT CO.

Phone Kearny 2095 No. 2 MARKET STREET, SAN FRANCISCO

OUR LEADING CIGAR BRANDS

FLOR DEL MUNDO

ALL HAVANA TOBACCO

FLOR DE UPMANN

A MILD, PLEASING BLEND

Goldberg, Bowen & Co.

SAN FRANCISCO OAKLAND

"Definite Varnish Values"

There is no varnish that may be used anywhere and everywhere.

Each type of service requires a specific varnish to meet its specific requirements. And no other will serve!

STANDARD VARNISHES embrace a scientific STANDARD for every VARNISH need.

That is why

Standard Varnish *WORKS!*

STANDARD VARNISH WORKS

NEW YORK CHICAGO LONDON
SAN FRANCISCO PARIS BRUSSELS MELBOURNE
INTERNATIONAL VARNISH CO Limited TORONTO
LARGEST IN THE WORLD AND FIRST TO ESTABLISH DEFINITE QUALITY STANDARDS

GEO. S. MacGRUER
258 Connecticut St. Phone Park 7700

ROBERT M. SIMPSON
483 Monadnock Bldg. Phone Douglas 5889

MacGRUER & CO.

CONTRACTING PLASTERERS
PLAIN AND ORNAMENTAL

Members Builders Exchange
180 Jessie St. Phone Sutter 6700

SAN FRANCISCO

WM. F. WILSON COMPANY

MODERN SANITARY APPLIANCES

Special Systems of Plumbing for Residences, Hotels, Schools, Colleges, Office Buildings, Etc.

Phone Sutter 357

328-330 Mason Street, San Francisco.

A. C. SCHINDLER, President. CHAS. F. STAUFFACHER, Secretary

THE FINK & SCHINDLER CO.

Manufacturers of INTERIOR WOODWORK AND FIXTURES
BANK, OFFICE AND STORE FITTINGS
SPECIAL FURNITURE

218-228 THIRTEENTH ST
Bet. Mission and Howard Sts.

SAN FRANCISCO, CAL.
Telephone: Market 474

J. A. Nelson
J. C. Hurley

J. C. HURLEY CO.

Telephone
Garfield 1959

CONSTRUCTING ENGINEERS

Heating and Ventilating Systems

509-511 Sixth St., SAN FRANCISCO

Underwriters' Labelled Fire Doors and Windows— Kalamein Interior Metal Doors and Trim — Metal Corner Bead — Metal Furniture, etc.

Capitol Art Metal Co., Inc.

Manufacturer of
SHEET METAL PRODUCTS

San Francisco Office, 400-406 NEW CALL BUILDING Tel. Sutter 6553
Factory, RICHMOND, CALIFORNIA

MILLER-ENWRIGHT CO.

SACRAMENTO, CAL.

PLUMBING SUPPLIES

STEAM and PIPE FITTINGS, VALVES, Etc.

PIPE—ALL KINDS
STEAM AND HOT WATER BOILERS
PENINSULAR HOT AIR FURNACES
Catalogues on Application

I. R. KISSEL

Phone Franklin 548

Decorator, Painter and Paperhanger

1747 SACRAMENTO ST., Bet. Polk St. and Van Ness Ave., SAN FRANCISCO

GRAVEL-ROCK

Quick Service any point in the San Joaquin Valley, Calif.

GRANT ROCK AND GRAVEL COMPANY

327-328 Cory Building

FRESNO, CALIF.

Clinton Welded Wire Fabric
CLINTON WIRE LATH

L. A. NORRIS COMPANY

Phone Kearny 5375 140 Townsend Street, San Francisco

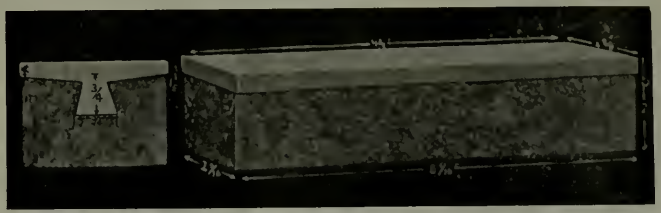
August F. Fick Albert E. Fick

FICK BROTHERS

PAINTERS, PAPER-HANGERS
AND DECORATORS

Dealers in
Paints, Oils, Varnishes, Glass

475 HAIGHT ST., San Francisco
Phone Park 4428—Res. Park 2148



GLASS BRICK has been found to possess both artistic and structural merits. Manufactured in any desired tone — bright or subdued — a substitute for Clay Brick for Exterior Walls of Hotels, Apartment Houses and Hospitals.
CALIFORNIA GLASS BRICK COMPANY, 228 Grant Ave., San Francisco, Cal.
GLASS WALL TILE, GLASS FLOOR TILE AND GLASS BASE Phone, Garfield 2042

Architects and Building Contractors

THE BINDING OF YOUR MAGAZINES
and PERIODICALS IS OUR SPECIALTY

Expert Plate and Map Mounting

THE HICKS-JUDD COMPANY
BOOKBINDERS

51-65 FIRST STREET SAN FRANCISCO, CAL.

BEAVER BLACKBOARD
BEAVER GREENBOARD
SCHOOL FURNITURE
AND SUPPLIES—
OFFICE, BANK AND
COURTHOUSE FURNITURE—
THEATRE AND
AUDITORIUM SEATING
Rucker-Fuller Desk Co.
677 Mission St., SAN FRANCISCO, CAL.
120 So. Spring St., LOS ANGELES, CAL.
432 - 14th Street - OAKLAND, CAL.

Phone Franklin 1006
Alex. Coleman
CONTRACTING
PLUMBER
706 Ellis Street, San Francisco, Cal.

HEATING-PLUMBING
COMPLETE PLUMBING AND
HEATING SYSTEMS INSTALLED
IN ALL CLASSES OF BUILDINGS
ALSO POWER PLANTS
GILLEY-SCHMID CO., Inc.
198 OTIS STREET, SAN FRANCISCO.
Tel. MARKET 965

McCRAY
REFRIGERATORS
BUILT TO ORDER
FOR
Home, Restaurant, Hotel or Club
We Carry a Full Line of Stock Sizes
NATHAN DOHRMANN CO.
Selling Agents
Geary and Stockton Sts., San Francisco

CALIFORNIA
PHOTO-ENGRAVING CO.
DESIGNERS & ILLUSTRATORS
ENGRAVERS ARTISTS
BOOKLETS
FOLDERS
121
SECOND ST.
SAN FRANCISCO.

Architectural
Photography
Western Photo Company
C. K. STOWE
Studio, Potter Building
576 Sacramento St., San Francisco

W. C. DUNCAN
& CO.
General Contractors
508 Sharon Bldg. San Francisco

Locks and Hardware
Representative for LOCKWOOD
MFG. CO'S Builders' Hardware.
Display Rooms—7th and TOWN-
SEND STREETS, San Francisco
PACIFIC HARDWARE & STEEL CO.

When writing to Advertisers please mention this magazine.

The Granite Work on Eldorado County Courthouse; National Bank of D. O. Mills, Sacramento;—and Sen. Nixon Mausoleum, Reno, WAS FURNISHED BY

CALIFORNIA GRANITE COMPANY

Phone Sutter 2646 STONE CONTRACTORS

San Francisco Office, 518 Sharon Bldg. Main Office, Rocklin, Placer Co., Cal.
Quarries, Rocklin and Porterville Telephone Main 82

SARGENT
REG. U. S. PAT. OFF
BUILDING HARDWARE

BENNETT BROS.
514-516 Market Street
SAN FRANCISCO - CAL.

A. KNOWLES R. H. MATHEWSON

KNOWLES & MATHEWSON
CONTRACTORS AND ENGINEERS
Fireproof and Reinforced Concrete Construction
442 Call Bldg., San Francisco, Cal.
Phone Sutter 4712

O. BAMANN, President ERNEST HELD, Vice-President

HOME MANUFACTURING CO.
BANK, STORE AND OFFICE FITTINGS
FURNITURE AND HARDWOOD INTERIORS
CABINET WORK OF EVERY DESCRIPTION
543 and 545 BRANNAN ST. Phone Kearny 1514 San Francisco, Cal.

PACIFIC MANUFACTURING COMPANY
MILLWORK, SASH AND DOORS
Hardwood Interior Trim a Specialty
MAIN OFFICE:
SANTA CLARA, CAL.
SAN FRANCISCO OFFICE, 177 Stevenson Street
OAKLAND.....486 Tenth Street
BERKELEY.....2143 Center Street
SAN JOSE.....16 N. First Street

MOST PRACTICAL and ECONOMICAL ARRANGEMENT for the MODERN EFFICIENT EQUIPMENT OF SCHOOL STAGES FURNISHED GRATIS
We have equipped 95% of those built in California
REFERENCES — Orpheum, Pantages or Empress Theatres, San Francisco. All Turner & Dahnken Houses. Theatres everywhere. Manual Arts High, Los Angeles. Chaffee Union High, Ontario. Santa Cruz High School. Bakersfield High School. And over one hundred others.
HIGHEST GRADE ARTISTIC WORKMANSHIP---CONTINUOUS HELPFUL SERVICE.
EDWIN H. FLAGG SCENIC CO. 1638 LONG BEACH AVE., LOS ANGELES 510 PANTAGES BLDG., SAN FRANCISCO

Thomas Elam Grover C. Elam

THOMAS ELAM & SON
GENERAL CONTRACTORS
Office, Builders' Exchange
180 Jessie Street
SAN FRANCISCO
Phone Sutter 6700

A. LETTICH
365 FELL ST., SAN FRANCISCO
Telephone — Park 234
Plumbing

When writing to Advertisers please mention this magazine

"Hooverize Your Fuel Supplies"

Experts in Pipe and Boiler Insulation

Asbestos Air Cell Covering for Low Pressure
85 per cent Magnesia Covering for High Pressure
Vesuvius High Temperature Blocks for Extra High Temperatures
High Temperature Cements for Furnace Lining

Contracts Solicited for applying Pipe and Boiler Coverings and satisfaction guaranteed by our corps of efficient workmen

—— also ——

Manufacturers of Vesuvius and Masco High Pressure Packings—Comet and Orinoco Low Pressure Packings—Hydraulic Packings for Hot and Cold Water — Extra Quality Flax Packings.

DEALERS IN

High Grade Rubber and Cotton Hose—Rubber—Leather —Red Stitched Canvas and Balata Belts.

IMPORTERS OF

Spartan Internal Boiler Paint — Kinghorn Metal Valves — Moncrieff Unific and Reflex High Pressure Gauge Glasses.

PLANT RUBBER & ASBESTOS WORKS

MANUFACTURERS AND DEALERS
SAN FRANCISCO, CAL.

INSURANCE SURETY BONDS

J. T. COSTELLO CO.

INSURANCE BROKERS

216 Pine Street, San Francisco Phone Sutter 188

Capital $1,000,000 CALIFORNIA DEPARTMENT Surplus $4,014,186.62

THE FIDELITY AND CASUALTY COMPANY OF NEW YORK

Prompt Service for

BONDS AND CASUALTY INSURANCE

203-206 Merchants Exchange Building SAN FRANCISCO, CAL.

ANY PLACE ANY TIME PROMPTLY "We Serve You"

ROBERTSON & HALL

GENERAL INSURANCE

Phone Sutter 2750 First National Bank Building, San Francisco

Telephone Sutter 5231 Member Insurance Brokers' Exchange

FRED H. BOGGS

INSURANCE

Foxcroft Building, 68 Post Street SAN FRANCISCO

CONTRACT BONDS

Fidelity and Surety Bonds of every kind.

C. K. BENNETT, Manager

FIDELITY AND DEPOSIT COMPANY OF MARYLAND

Telephone Kearny 1452 701 Insurance Exchange, San Francisco, Calif.

PACIFIC DEPARTMENT

Globe Indemnity Company

BONDS and CASUALTY INSURANCE for CONTRACTORS

120 Leidesdorff Street Phone Sutter 2280 SAN FRANCISCO

C. D. VEZEY O. G. LAWTON

LAWTON & VEZEY

BUILDING CONSTRUCTION

PHONE LAKESIDE 91 206 PLAZA BUILDING, OAKLAND

STOCKHOLM & ALLYN

GENERAL CONTRACTORS

Telephone Douglas 4657 Monadnock Building, San Francisco

When writing to Advertisers please mention this magazine.

Phone Kearny 3526

A. H. Bergstrom
Eric Lange

LANGE & BERGSTROM
BUILDING CONTRACTORS
(ESTABLISHED 1900)

207-210 Sharon Bldg. San Francisco

THE FISH FUEL SYSTEM
The Safest, Cleanest, Hottest Fuel on Earth

This SYSTEM supplies Heat, Light and Power at Lowest Cost. A Commercial Plant in operation at 50-54 – 8th St., San Francisco. Telephone Market 4070.

UNION GAS-ELECTRIC COMPANY
PALACE HOTEL SAN FRANCISCO

Member Builders' Exchange
180 Jessie Street
Telephone Sutter 6700

Residence 2909 California Street
Telephone Fillmore 1427

C. C. MOREHOUSE

Plain and Ornamental PLASTERING. Imitation STONE WORK of All Kinds
Exterior CEMENT PLASTERING. Metal FURRING and LATHING
MODELING and CASTING. STUCCO WORK

Office and Shop: 872 FOLSOM ST., San Francisco
TELEPHONE SUTTER 6509

E. T. LEITER & SONS, Inc.
GENERAL CONTRACTORS
Phone Sutter 1980

ARTHUR ARLETT
BUILDING CONSTRUCTION

CALL BUILDING SAN FRANCISCO

When writing to Advertisers please mention this magazine.

ALFRED H. VOGT
Formerly FOSTER VOGT COMPANY
CONTRACTOR
231 Builders Exchange Building SAN FRANCISCO

GEO. A. BOS, Consulting Engineer
BOS & O'BRIEN
General Contractors
HEARST BLDG., SAN FRANCISCO
Phone KEARNY 3021

P. A. Palmer Peter Petersen W. L. Kelley O. G. Hoaas
PALMER & PETERSEN
Contracting Engineers
774-776 Monadnock Building SAN FRANCISCO, CAL.

Residence 2887 GREEN STREET Res. Phone, West 9451 Office Phone, Sutter 3580
P. MONTAGUE CO.
TEAMING AND GRADING
Office: General Contractors' Assn. 110 Jessie Street, San Francisco

C. L. WOLD Office Phone Sutter 4971 JOSEPH DUNN
C. L. WOLD COMPANY
GENERAL CONTRACTORS
75 SUTTER STREET, Cor. Montgomery, SAN FRANCISCO
GENERAL CONTRACTORS ASSOCIATION Phone Sutter 3580

HOUGHTON CONSTRUCTION CO.
Engineering and Construction
SPECIALIZING IN REINFORCED CONCRETE, RAILWAY and INDUSTRIAL CONSTRUCTION
Main Offices, Flatiron Bldg., San Francisco

J. D. HANNAH
Contractor and Builder
OFFICE: 725 Chronicle Building
San Francisco, Cal.
Telephone Douglas 895
BUILDERS EXCHANGE, 180 JESSIE STREET

D. ZELINSKY & SONS
INCORPORATED
PAINTERS AND DECORATORS
420 TURK STREET, SAN FRANCISCO

UNITED STATES STEEL PRODUCTS CO.

Rialto Building, San Francisco

SELLERS of the products of the American Bridge Co., American Sheet and Tin Plate Co., American Steel and Wire Co., Carnegie Steel Co., Illinois Steel Co., National Tube Co., Lorain Steel Co., Shelby Steel Tube Co., Tennessee Coal, Iron and Railroad Co., Trenton Iron Co.

MANUFACTURERS OF

Structural Steel for Every Purpose — Bridges, Railway and Highway — "Triangle Mesh" Wire Concrete Reinforcement — Plain and Twisted Reinforcing Bars — Plates, Shapes and Sheets of Every Description — Rails, Splice Bars, Bolts, Nuts, etc. — Wrought Pipe, Valves, Fittings, Trolley Poles — Frogs, Switches and Crossings for Steam Railway and Street Railway — "Shelby" Seamless Boiler Tubes and Mechanical Tubing—"Americore" and "Globe" Rubber Covered Wire and Cables — "Reliance" Weatherproof Copper and Iron Line Wire—"American" Wire Rope, Rail Bonds, Springs, Woven Wire Fencing and Poultry Netting — Tramways, etc.

United States Steel Products Co.

OFFICES AND WAREHOUSES AT

San Francisco - Los Angeles - Portland - Seattle

HERMAN T. LUDWIG
Building Construction
Phone Valencia 2539 636 Jessie Street, Near 7th, San Francisco

GEO. W. BOXTON & SON
General Contractors
Office, 1233 HEARST BUILDING SAN FRANCISCO, CAL.
Telephone Sutter 1601

Phone Kearny 381 J. M. Morrison F. H. Masow
MASOW & MORRISON
GENERAL CONTRACTORS
BUILDING CONSTRUCTION
518-522 Monadnock Bldg. San Francisco

Res. Mill Valley, Telephone Mill Valley 240 Member of General Contractors Association
HARVEY A. KLYCE
GENERAL BUILDING CONTRACTOR
408 New Call Building, SAN FRANCISCO Phone Douglas 3280

BURT T. OWSLEY
GENERAL CONTRACTOR
CALL-POST BUILDING SAN FRANCISCO

MacRORIE-McLAREN CO.
LANDSCAPE ENGINEERS and GENERAL NURSERYMEN
Office, 141 POWELL STREET, San Francisco
Nurseries at Beresford, San Mateo County

Phone Sutter 2581
LARSEN-SAMPSON CO.
BUILDING CONSTRUCTION
601 CROCKER BUILDING SAN FRANCISCO

GEO. FARRELL, BURLINGAME
Res. Phone Burlingame 1045
W. N. REED, 239 PRECITA AVE.
Res. Phone Valencia 6020
FARRELL & REED
CONTRACTORS
ROOM 334
BUILDERS' EXCHANGE
Telephone Sutter 450
185 STEVENSON STREET
SAN FRANCISCO

Dependable Varnishes

Fullerspar Forty for Finishing
Fifteen for Floors Fifty for Flatting

FOR WORK OF THE HIGHEST QUALITY FULLER VARNISHES POSSESS ALL THE ELEMENTS MOST DESIRED BY ARCHITECTS

Paleness, free flowing, beauty of finish and ability to withstand rough wear are characteristics found in FULLER Varnishes. The entire line of Varnishes is distinctive in quality and may be used with absolute confidence.

W. P. Fuller & Co.

Specialized Paint and Varnish Products
For Every Purpose